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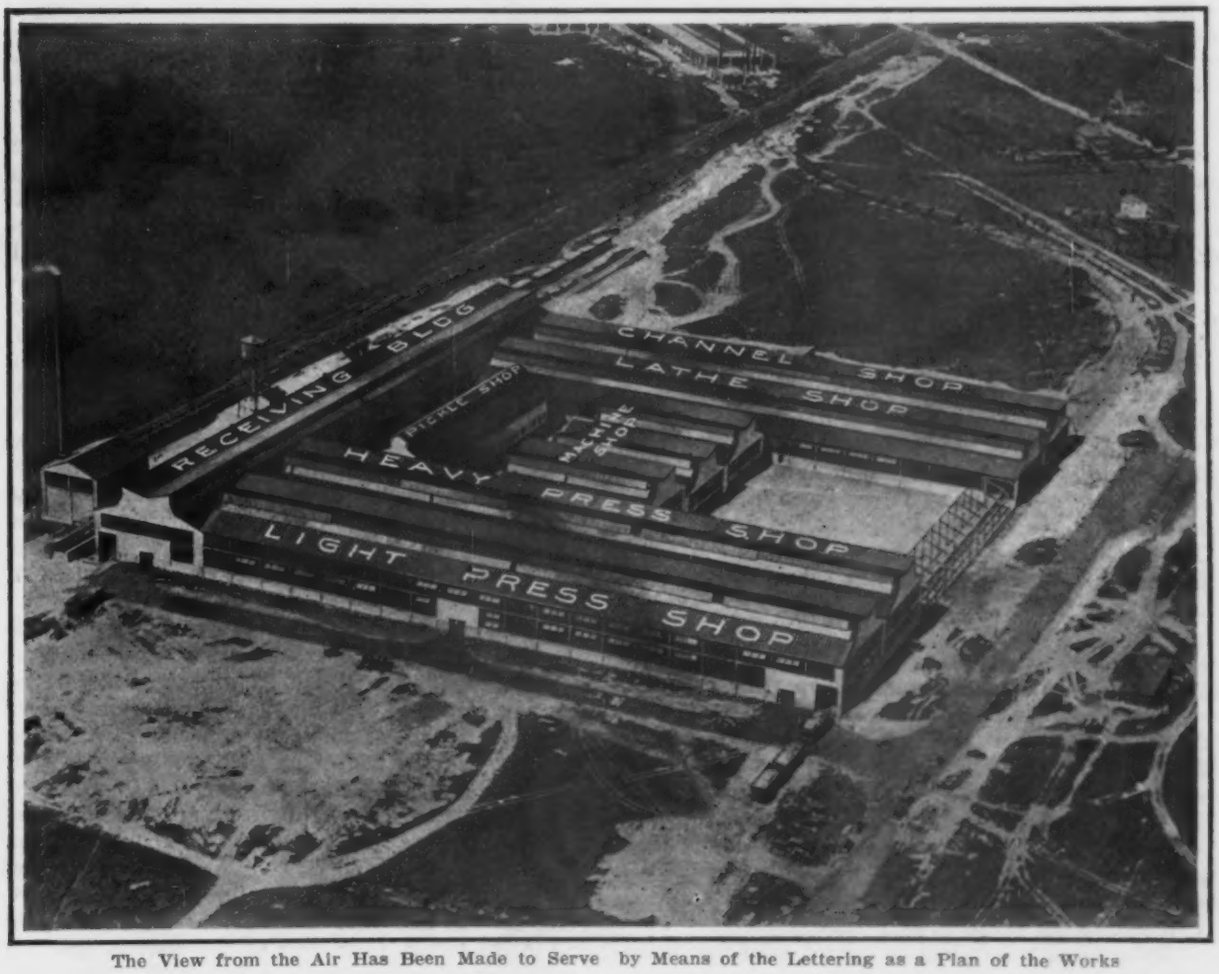
Routing of Material Feature of Plant

Youngstown Pressed Steel Co. Introduces Tunnels Under New Shops to Avoid Congestion of Traffic—Other Operating Economies

BY F. L. PRENTISS

OWING to the large volume of material that will be handled in the new plant of the Youngstown Pressed Steel Co., Warren, Ohio, for the manufacture of steel stampings, prime importance attaches in the layout to the routing of material. The plant is so designed that "back-tracking" of material is eliminated to as large an extent as possible. An outstanding feature is the provision of tunnels under the press shop floors for handling both product and scrap in order to reduce trucking on the floor. By the use of tunnels one-half of the traffic is diverted from the press shop floors and congestion around the presses is avoided. As a general rule the movement of material on the press shop floor will be in a forward direction and "back-tracking" will be done in the tunnels.

The plant includes a jobbing press shop for making pressed steel parts for automobiles and for the manufacture of other sheet metal parts, also a fireproofing material department in which various products for the building trades are manufactured. These include expanded metal, corner bead, cold formed channels, etc. The plant has a total capacity of 3500 tons per month and is located on a 40-acre site on the main line of the Erie Railroad, with close connection to the Pennsylvania and Baltimore &



The View from the Air Has Been Made to Serve by Means of the Lettering as a Plan of the Works

The Receiving Department Adjoins and Is Located at Right Angles to the Press Shops and Other Production Departments. Raw material is unloaded from the depressed track on the left. Large floor space provides for separate piles of sheets for each individual order

Ohio railroads. It is so designed that additional units can be added in conformity with the general plan.

The plant, 532 x 562 ft., is laid out nearly in the form of a square, and occupies 7 acres, of which five and one-third acres are under roof in connected buildings. There are five main buildings. On one side there is a receiving building extending the length of the plant, 80 x 562 ft., into which raw material is delivered. At right angles to this, at one end, is the light press shop, and adjoining and connected to this is the heavy press shop. Each of these buildings is 80 x 450 ft. Adjoining the opposite end of the receiving department are two connected buildings, similar in size to the press shops. One of these is the channel shop and the other the expanded metal shop. With this arrangement there are four parallel connected manufacturing buildings that connect with the receiving building at one end, leaving a space 240 ft. wide between the press shops and manufacturing department.

In parallel line with the receiving building, at the opposite ends of the four production shops is a shipping platform that extends the length of the plant through the lower end of the two main sections, and has a connecting link in the form of a covered track shed between the buildings, providing a shipping platform 562 ft. long, or space for 14 railroad cars. The shipping platform is inclosed with rolling lift doors at each end.

As arranged the plant is served with two main railroad sidings running parallel, one extending the length of the receiving department on one side, and the other extending along the inclosed shipping platform on the opposite side. The tracks are depressed in both the receiving and shipping departments.

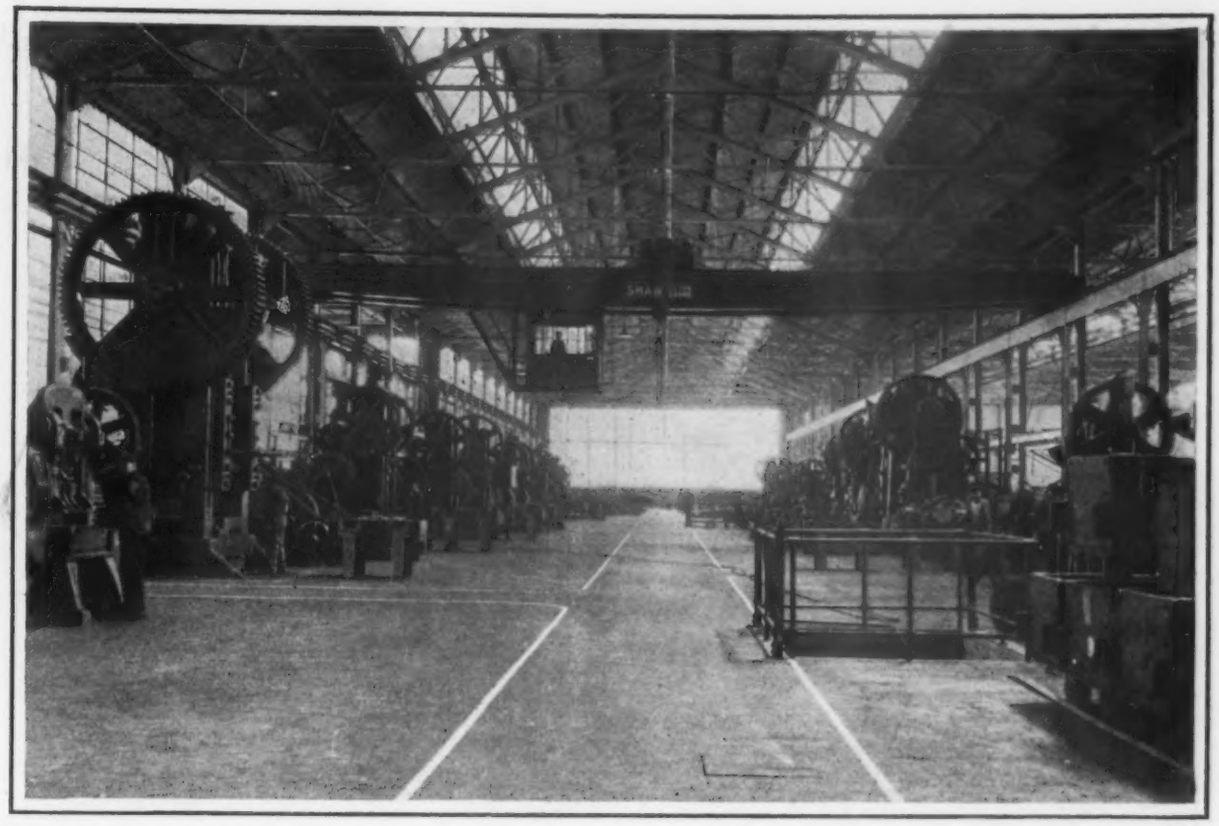
The plant layout allows for a court in the center, approximately 240 x 450 ft. This is partly occupied by the pickling department, 50 x 200 ft. adjoining the receiving department, and at the center by three interconnected maintenance buildings, each 80 x 112 ft. In these are located the machine shop, store room, die storage room, millwright department and factory offices, bringing the maintenance departments in a central location in respect to all manufacturing departments.

Features of the buildings include unusually good lighting facilities, both daylight and artificial, ventilation, and a forced hot water heating system. The buildings are of steel with Pond monitor roof construction and Truscon steel sash fenestration. This type was adopted to provide adequate ventilation. The press shops are 31 ft. and the channel and expanded metal departments 21 ft. from the floor to the bottom chords of the roof trusses. The windows are glazed with ¼-in. wire-ribbed glass in the monitors, and ⅛-in. factory-ribbed glass in the side walls.

It has been found that production falls off materially during night operations in a press shop that is not well lighted. To keep night production as near maximum as possible, and to safeguard press operators, a high artificial illumination is provided with over 100 per cent more foot candle power than is required by the Ohio Factory Code. Diffused lighting is secured with Nitrogen Mazda lamps located below the roof trusses 30 ft. above the floor in the press shops and 20 ft. above the floor in the fireproofing departments. In the former there are three rows of 500-watt lamps across the 80-ft. bays, and in the latter, four rows of 300-watt lamps.

The roof is gypsum cast in place. With this type a lighter steel frame structure could be used than would be necessary for buildings carrying a heavier roof. The building columns are 12-in. Bethlehem H sections, with 12-in. Bethlehem I beams, supporting the crane runways. Standardization was followed in the building construction, all the buildings having the same dimensions for spans, trusses and column centers.

All raw material goes into the receiving build-



View Down the Heavy Press Shop Showing in the Foreground One of the Elevator Shafts That Connect the Press Room with the Tunnels Beneath. With the use of the tunnel, back tracking on the floor and congestion of parts around the presses is avoided

ing and is unloaded from cars with a 10-ton Shaw electric traveling crane. This building was made large enough to provide ample storage room so that piles of sheet steel for each individual order can be kept separate on the floor, avoiding the necessity of moving part of a pile to secure stock that might be at the bottom. The entire width of the building, except that occupied by the railroad track and a small amount of machinery equipment on one side, is used for storing the stock. This department is equipped with shears for cutting the stock, and a scrap baler will also be installed.

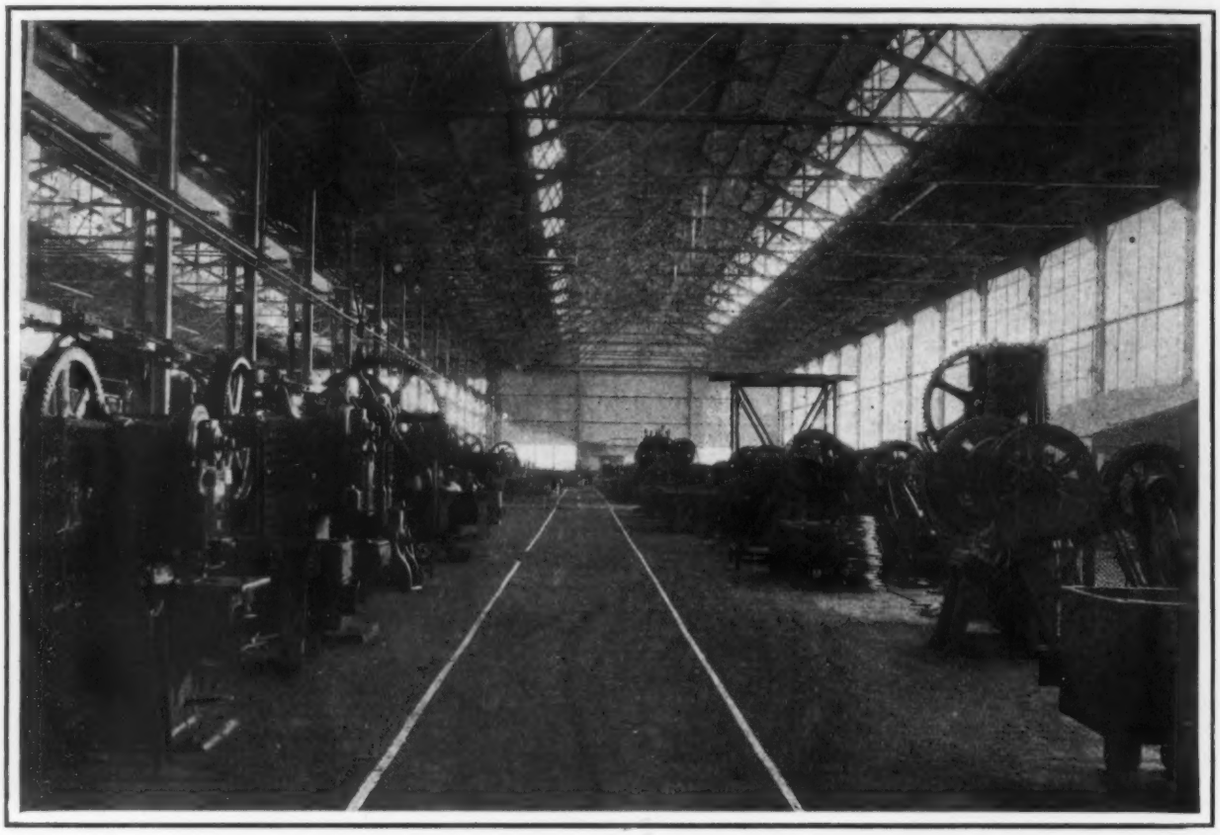
The stamping departments are equipped with various types of presses ranging in size from 3 in. to 17 in., the largest having a 300,000-lb. ram pressure for forming heavy truck brake drums, car wheels and other heavy stampings ranging from ½ in. to ⅝ in. in thickness. In the light stamping department the presses are located in two rows, one row in the center of the building and the other along the inner columns. Along the outer wall is the assembling department, carpenter shop and employment office. In the heavy press shop there are two rows of presses, one on each side, with a 20-ft. space from the front of the press to the wall. Each press department is served by a 10-ton Shaw crane.

There are two tunnels under the heavy press shop, one being located directly in front of each line of heavy presses, and extending nearly the length of the shop. The tunnels are of concrete, 11 ft. wide and 7 ft. high, and are built to carry a load of 3000 lb. per sq. ft. The tunnels and press foundations are so constructed that the front of the press is supported on the outside wall of the tunnel. An opening is provided in each press foundation which forms a recess in the tunnel in which tote boxes are placed for handling parts or scrap which pass from the press through an opening beneath into the tote box. In the case of a punching operation the scrap drops through, but if it is a drawing or a blanking operation the part drops into the tote box.

The tunnels will be used principally for blanking and drawing work, the blank or part passing through into the tote box, in which they will either be returned by hand or storage battery elevating platform trucks, to the press room floor and deposited at the side of a press for the next operation, or go through the tunnel to the pickling department for pickling and annealing operations. Two elevators will be installed connecting the tunnel with the press shop floor, and another elevator will connect the tunnel with the pickling department. From the pickling room the material will be trucked back to the floor of the press shop. The tunnels not only will eliminate traffic on the floor, but reduce handling of boxes of stampings in process of manufacture from under the presses, thus preventing congestion around the presses. Only two sets of boxes are required at a press during a blanking operation, one set for stock and the other for scrap. Generally stock will be routed from the receiving room to the shears in that department, then to the presses, and after such press and pickling and annealing operations as may be required to convert the blank into a finished stamping, on to the assembling, inspection and shipping departments. However, the stock may go first to the pickling department and then back to the shears, and then on to the press department. The inspection department occupies space across the plant in front of the shipping department, so that it is impossible for a stamping to get through into the shipping room without first passing the inspectors.

All the large presses are driven by individual motors with gear sets, and the smaller in groups of 8 from line shafts operated by chain drive from motors are located in pits just beneath the floor. Some of the smaller presses are driven from a countershaft attached to the columns.

No electric motor controllers are placed on the



An Example of Aisle Demarcation Is Shown in the View of the Light Press Shop

floor of the shops but are located either in the tunnels in groups for the adjacent presses, or on a controller bridge 15 ft. above the floors, where they are in charge of an electrician, where they are not in danger of being tampered with by other employees.

Magnetic control is provided with push button switches at the presses. The controllers are equipped with overhead relays and with automatic cutouts. General Electric equipment is used throughout with the exception of the transformers, which were supplied by the Packard Electric Co., Warren. The main distributing switchboards for light and power are centrally located, there being two switchboards and separate transformers, one for each department.

The pickling department in the inner court is connected with the other buildings by covered runways, one to the receiving department, one to the press departments, in addition to the tunnel, and two to the fireproofing departments. The building occupied by the pickling department has a special type of monitor, provided with baffles instead of louvres so that fumes and smoke will pass out freely and at the same time protect the interior from rain. This department is equipped with five tumbling barrels, for taking the scale and sharp edges off small stampings, a Mesta pickling machine, three oil-fired annealing furnaces, and a Niagara washing machine. The exhaust steam from the pickling machine will be utilized in heating the pickling room. This will pass through the heating coils and the air, drawn around the coils by means of a suction fan, will be circulated through the room. This heat distributed around the floor will also aid in carrying the fumes up to the roof. In summer time when heat is not required a fan may be used to circulate fresh air into the room and thus help ventilation.

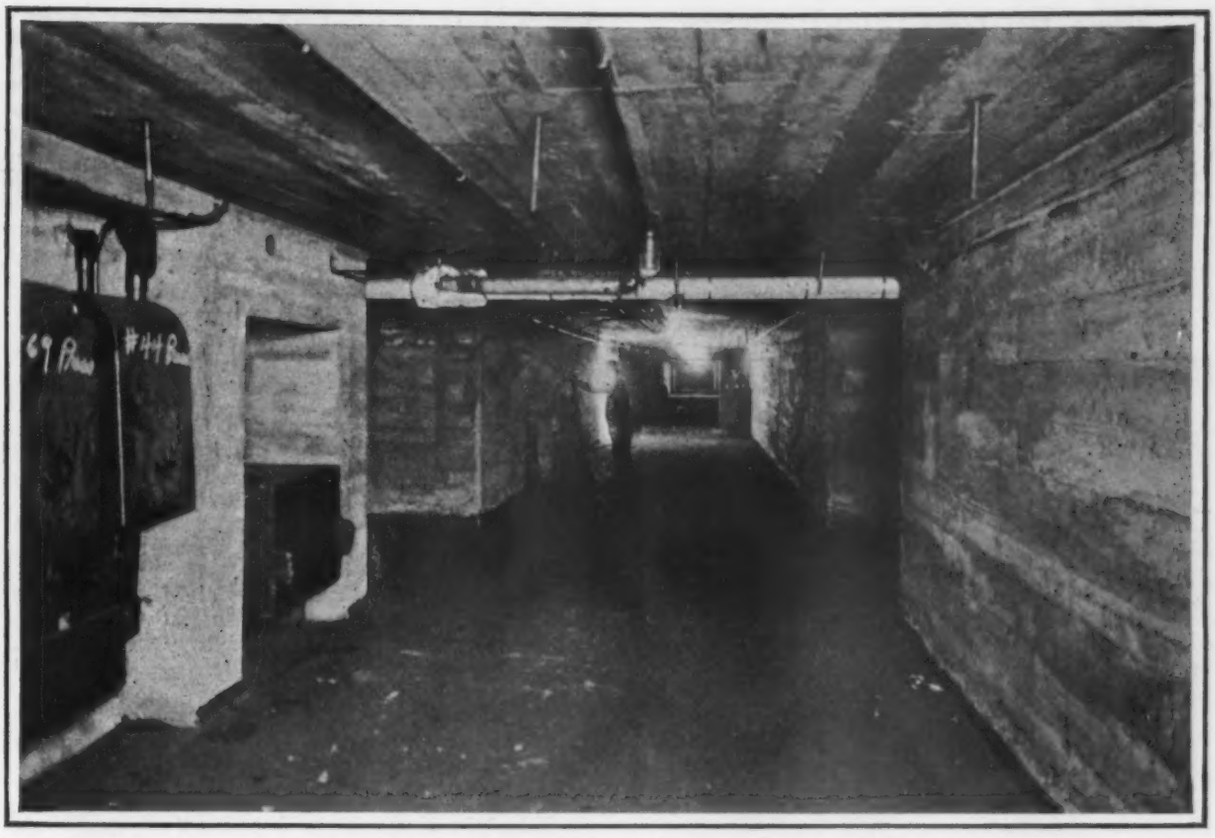
Stock made into expanded metal is routed directly from the receiving building to the pickling department and then to the storage and shipping floor at the lower end, the movement being in a straight line. Stock for the channel shop also goes in a straight line from the receiving department to the machines in the fabricating shop and on to the stock and shipping departments.

As previously pointed out the maintenance departments are centrally located in the court between the manufacturing buildings, with which they are connected, this arrangement making the machine shop, die storage and tool departments and storeroom convenient to reach from all parts of the plant. The die storage department and the section of the machine shop occupied by the larger machines will be served by an overhead crane. One feature of the arrangement of the plant is a wide aisle providing a driveway for trucks that extends straight across the plant at the center, through both press shops and then through the center of the maintenance building, between the machine shop on one side and the die storage department, stock room, etc., on the other side, and on in to the warerooms of the fireproofing material departments. There are chalked aisles in front of each row of machines in the press departments.

All partitions are of expanded metal, so that the superintendent can get a clear view of all parts of the plant, with the exception of the experimental shop and shop offices which have solid inclosures. Expanded metal is also used for gear guards.

Adequate toilet room facilities are provided, located in pressed sheet metal inclosures 6 x 22 ft. between the building columns. Along the outside of these inclosures on each side are wash basins with spray heads over each basin. A Taco heater is located over each unit for supplying hot water, which is heated at each unit by exhaust steam.

The plant is heated by a forced hot water system. The heating coils, arranged in virtually continuous series, serve as mains so that there are practically no main supply lines in the building. The power house is located a short distance from the plant, with which it is connected by a tunnel,



Recesses on the Side of the Tunnel Provide for Tote Boxes into Which Work Drops from the Machines Above. At the extreme left is one of the controllers for the press motors

in which the flow and return pipes for the heating system are carried. This permits the control of the heating from the power house and prevents losses due to overheating and the opening of windows instead of the turning off of the radiators by workmen. The system also permits almost the entire elimination of valves. Another reason for the adoption of this system is that if for some reason commercial power is not available, turbo generators can be installed and the exhaust steam from the turbines can be utilized for heating or the turbines can be run condensing.

Hot water is circulated through the system by two turbine driven centrifugal pumps. In the power house are located two 300-hp. Sterling boilers, circulating pumps, air compressor, main switchboard and other equipment. The engineering work in connection with the hot water system was done by the McCann-Harrison Co., Cleveland, and the system was installed by the Grinnell company. Fuel oil, benzine and acid are stored in 12,000 gal. tanks outside the plant. Acid flows by gravity to the pickling shop.

The organization of the Youngstown Pressed Steel Co. and the building of the plant resulted from the purchase in 1917 of the Youngstown Iron & Steel Co. by the Sharon Steel Hoop Co. The Youngstown company operated a pressed steel department and both the Sharon and Youngstown companies operated small departments for fabricating building materials. After the Sharon company took over the Youngstown plant, it was decided to merge all of the fabricating departments and sell them to an entirely new company. Accordingly the Youngstown Pressed Steel Co. was incorporated and Warren was selected as the location of the new plant.

The A. H. Petersen Mfg. Co., Milwaukee, Wis., has discontinued the manufacture of tools and dies and will devote its entire plant to the output of "hole shooter" portable electric drills and other automotive devices.

DETROIT-WINDSOR BRIDGE

Proposed Structure Will Require 80,000 Tons of Steel Shapes

DETROIT, June 25.—According to the announcement of Charles Evan Fowler of New York, engineer in charge of the proposed Detroit-Windsor bridge, the bridge will be an actuality by 1926. Mr. Fowler says that the bridge financing has virtually been completed, and that al lother arrangements are so far along that little, if any, doubt is left that it will go through.

The bridge will be of the suspension type, closely resembling the Williamsburg bridge, New York. It will span the river at a point where the channel is narrowest, and will be 1805 ft. long, 110 ft. above the water at the highest point in the span, and will be, according to Mr. Fowler, the longest and heaviest bridge in the world.

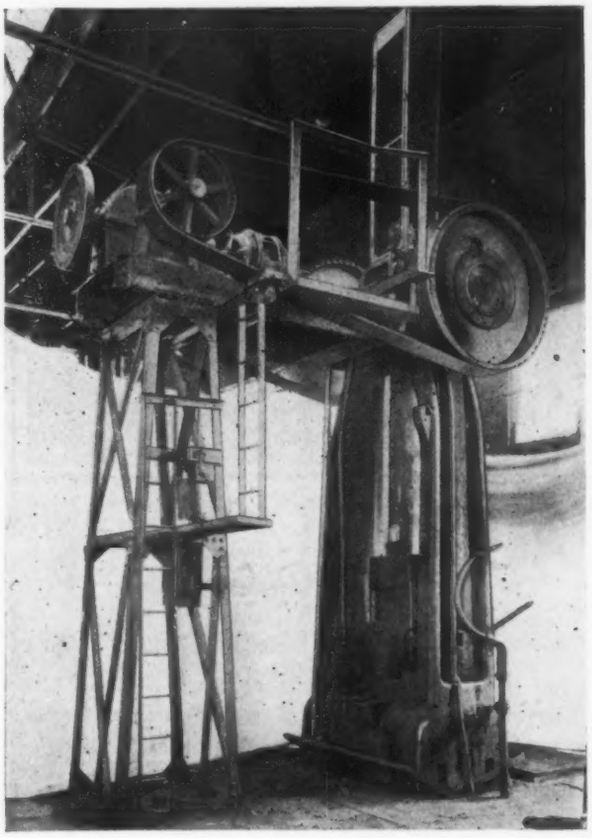
The towers from which the supporting cables will be strung will be 150 ft. higher than the highest building in Detroit, or approximately 400 ft. high. Eight cables, consisting of 10,000 wires each and capable of sustaining a strain of 240,000 lb. to the sq. in., will be strung, one wire at a time, until the eight cables are completed, and wound with additional wire. In other words, there will be, in the eight big cables, 50,000 miles of wire, quite enough to tie a double hitch around the world. Besides the cables, the bridge structure will require 80,000 tons of steel, many tons of concrete and other materials. The wire will be furnished by the John A. Roebling Sons' Co., Trenton, N. J., which supplied the cables for the suspension bridges over the East River in New York.

As an outcome of a recent meeting at the Bureau of Standards, Washington, a conference was held at Asbury Park on the subject of corrosion of metals. The best methods for co-operative research on corrosion were considered. The recent meeting at the bureau was held by the advisory committee on non-ferrous alloys. It was the sense of the committee that the corrosion of metals was the most important point that had been discussed and should receive further attention.

Motor Drive for Drop Hammers

The application of individual motor drive for machine tools has been extended by the General Electric Co. to the equipment of several board drop hammers in their Schenectady works. The drive was originally applied as an experiment to a 300-lb. hammer, and proving successful, has been expanded to include hammers of 600, 1500 and 2500-lb. sizes. The design is the same in all cases, except for variations made necessary by the increased weight of the hammer. The only basic change since the first ones were installed is the use of induction instead of direct current motors for the drive.

As shown in the accompanying illustration the



Length of Drop Is Controlled by An Adjustable Trigger on the Frame Coming in Contact with a Stud on the Hammer

whole outfit consists of two towers, one composing the hammer mechanism proper and the other serving to support the other end of the platform carrying the motor, gears, etc. A 15-hp., 800-r.p.m., 40-cycle induction motor is directly coupled to a shaft carrying one loose and one keyed pinion and a flywheel on the extreme end. The flywheel serves to take the initial peak load off the motor when the hammer is drawn up. The keyed pinion engages two beveled gears which are direct connected to two pulley wheels, the loose pinion acting as a spacer on the opposite side of the bevel gears. This arrangement of gears causes the two pulleys to revolve in opposite directions and these are belted to pulleys on the shafts of the rollers which, when forced together raise the hammer. The gearing is enclosed and immersed in oil. The total speed reduction through gears and pulleys is 8 to 1.

Once the motor is started it runs continuously, operation of the hammer being through a treadle control which separates the rollers and lets the hammers down. The length of the drop is controlled by an adjustable trigger on the hammer frame which comes in contact with a wooden stud on the hammer. Repeated blows can be obtained automatically by this arrangement, as long as the treadle is depressed. The force of the blow cannot be regulated as it is due entirely to gravity.

Among the advantages afforded by the individual motor drive for hammers of this type may be mentioned the possibility of running a crane directly over the hammers, which was impossible with the shaft drive. The motor drive also removes the necessity for a system of braces, both for the shaft and the hammer frame, to maintain proper alinement. The hammer can be placed wherever it is most convenient to furnaces, shears, etc. It is also claimed that the driving pulleys do not get out of alinement owing to vibration of the hammer or to other causes. The platform carrying the motors, gears, etc., is supported by two heavy wooden bolsters which give it a certain amount of resiliency and is free to shift slightly horizontally at the tower end. Therefore the belts tend to hold it in alinement and the driving mechanism is free from vibration due to the hammer.

Coal-Washing Problems

WASHINGTON, June 28.—Carl A. Wendell, New York, has been appointed consulting engineer of the United States Bureau of Mines in matters relating to coal washing and coal preparation. Mr. Wendell, who has specialized in coal washing problems in this country since 1903, was in charge of the coal washing investigations of the United States Steel Corporation at Joliet, Ill., from 1908 to 1913 and since the latter year has given his time to such matters in a general consulting capacity.

After July 1, he will visit several Eastern stations of the Bureau of Mines, and subsequently will advise with Bureau officials as to a program for further development work in investigation and improvement of coal preparation methods.

The principal work of the Bureau along this line is being conducted at the Middle West station at Urbana, Ill., and at the Northwest station at Seattle, Wash. Research is being carried on at Urbana, using the laboratory of the University of Illinois, in order to assist in the development of successful methods for cleaning high sulphur coals, particularly coals of the Central Western field, and to render them suitable for gas manufacture and coking.

Lower Bids on Ships

WASHINGTON, June 28.—Out of a list of 25 bidders, the Bath Iron Works, Bath, Me., submitted the lowest figures and probably will be awarded the contract for building five light vessels for the Lighthouse Service, Department of Commerce. The Bath company is to construct the five vessels for $920,000, or $184,000 each. This is at the rate of $347 per construction weight ton. Unusual interest was manifested in the bids because of the present condition of the shipbuilding industry and was evident by the number of bidders. To illustrate the change in shipbuilding conditions in the United States, the commissioner of lighthouses has pointed out that at the previous opening of bids for a vessel, Aug. 1, 1919, only two bids were received and the lowest was $396,750 for one vessel, somewhat larger than any of the five vessels to be built by the Bath Iron Works, but at the rate of $692 per construction weight ton. The five light vessels are to replace old ones.

Exports Under Webb-Pomerene Act

WASHINGTON, June 28.—Steel, copper and cement to the value of $127,000,000 were exported in 1920 by corporations organized under the Webb-Pomerene act, according to a statement issued by the Federal Trade Commission. The value of locomotives, machinery, pipes and valves, and foundry equipment, including wood pipe and tool handles, is estimated at more than $25,000,000. Textile machinery was exported chiefly to France, Spain and Italy. Large orders for locomotives are noted for Belgium and Roumania. The statement does not separate the various products to show the value of exports, whose total by associations under this act amounted to $221,000,000 in 1920. There is only one steel organization formed under this law, the Consolidated Steel Corporation.

Further cuts have been made in the working forces of the Fore River Works, Quincy, Mass., Bethlehem Shipbuilding Corp. Work on the many million dollars' worth of Government work on the books of this subsidiary has been held back by the authorities at Washington because of lack of funds.

Whitaker-Glessner Continuous Mill

For Making Sheet Bars or Billets—Includes Edging Rolls—Approach Table with Skewed V-Groove Rollers for Centering Blooms

ONE of the most modern continuous mills in the country has been recently put in operation at the Portsmouth plant of the Whitaker-Glessner Co. By this addition the company has considerably increased its production of finished steel and is now in a position to expand its plant further, which normally employs some 5000 men.

The mill was built by the Morgan Construction Co., Worcester, Mass., and consists of six stands of 18-in. roughing and finishing rolls together with two edging mills, located respectively before the first and third roughing passes. Provision is made for drawing loops between each pass when rolling sheet bars; and by use of the edging rolls, 10-lb. sheet bars may be rolled, with good edges and of accurate weight, from slabs 12 in. wide and 2½ in. thick, without having to use tongue and groove passes. The shoes are arranged so that each mill may be lifted off separately and replaced with mills assembled, ready for rolling blooms 4 in. square to billets 1½ in. square—twisting guides being placed between each alternate pair of rolls.

The capacity of the mill is at present limited in production by the blooming mill, but it is capable of producing 40,000 tons of 10-lb. sheet bars per month.

Fig. 1 shows the mill assembled for rolling sheet bars. In the upper left-hand corner may be seen the skew approach table, which was built by the Wheeling Mold & Foundry Co.; this table is provided with rollers 14 in. in diameter, which are set at an angle with the center line of the table. This arrangement enables the operator to center the blooms quickly on the table ready for the first pass, as V grooves are cut in each roller 3 in. deep with sides sloping at 45 deg. When the bloom is delivered to this table, it clings to the side guard while traveling, but just before it is cropped by the preliminary shear, the table is reversed and the bloom travels laterally across to the center, where it drops into the V groove and is ready for the first pass. All of the table gears are cut and run in oil and Hyatt bearings are used.

The mill proper is driven by a 5000-hp. 3-phase 60-cycle 2200-volt motor of 440 r.p.m., which was built by the General Electric Co. Both the motor and the control are protected by a brick inclosure with a removable roof, thus to allow the use of overhead mill crane while making repairs.

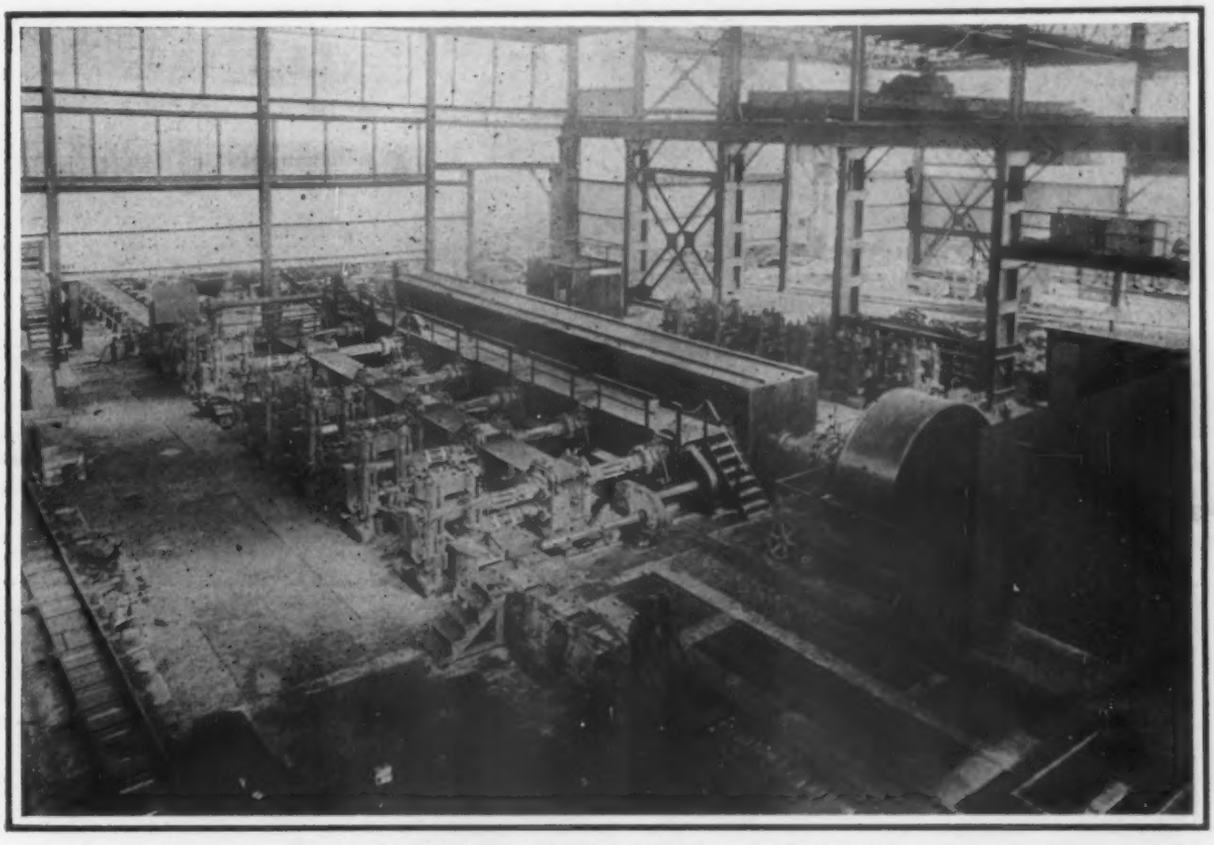


Fig. 1—The Continuous Mill Assembled for Rolling Sheet Bars

The main drive was built by the Woodard Machine Co., Wooster, Ohio, and consists of a double helical pinion and gear unit, which reduces the speed from 440 to 80 r.p.m. The forged steel pinion is cut integral with the shaft, while the gear is of cast steel with split hubs held together with shrink rings. The gear cover is of cast iron made tight to permit the gears to run in oil, and the bearings are connected with a Bowser gravity feed oiling system, which lubricates all the mill bearings and mill pinions, these being built for oil lubrication only.

In the foreground may be seen an Edward-Carroll flying shear, which operates by steam. Adjustment of the shear trip can be made on the shear table so that multiples of any desired length of sheet bar can be cut.

Fig. 2 shows the end of the shear table elevated to deliver sheet bars to the pinch rolls, which in turn deliver them to a removable bar piler shown in Fig. 3.

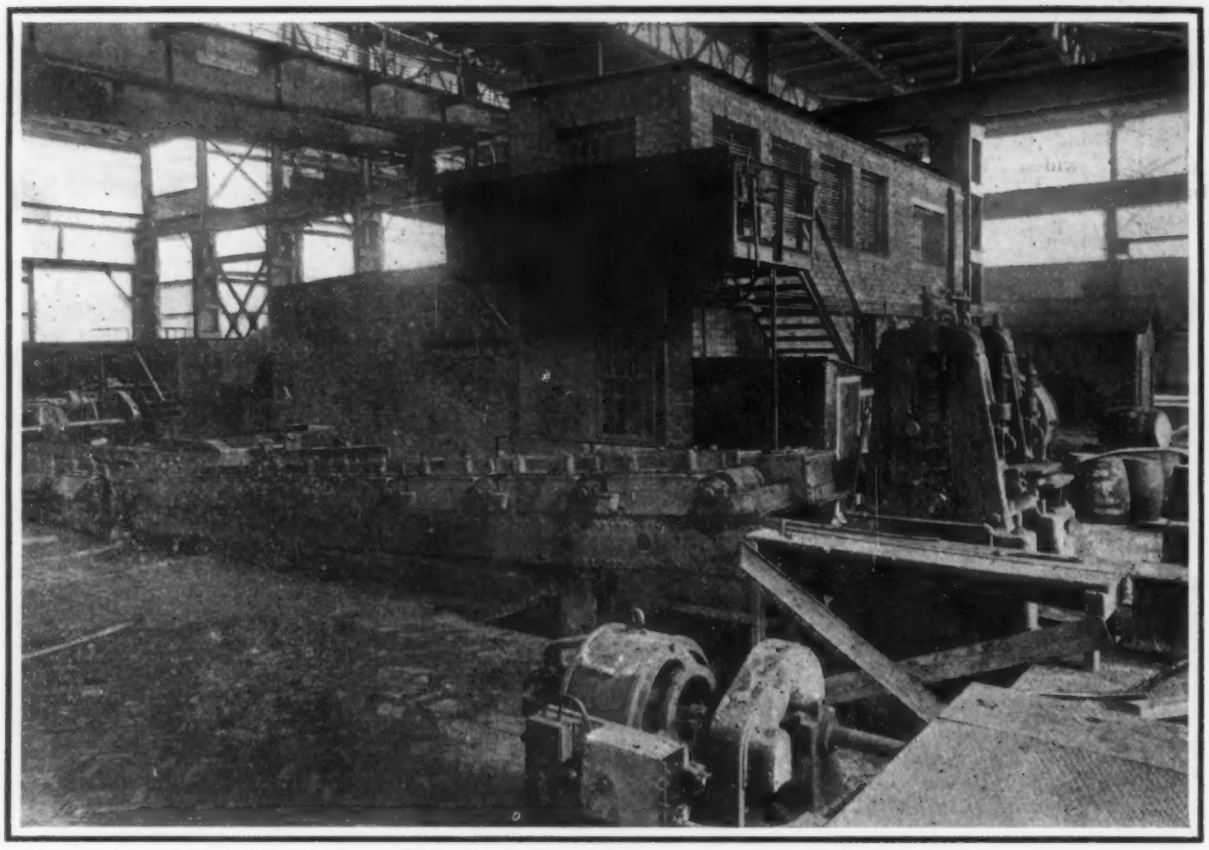


Fig. 2—Shear Table Elevated to Deliver Sheet Bars to the Pinch Rolls

Here the sheet bars are stacked approximately 24 in. high and are then removed by a lifting beam with six hooks attached to the overhead crane, which conveys them to the cooling bed. When rolling billets, the end of the shear approach table is lowered level with the skew assembling table, from which the bar piler has been removed. This table has a capacity of 8000 lb. of 1½-in. billets and is provided with skewed rollers which group the billets of approximately 30 ft. lengths and deliver them by means of a straight edge to the cooling bed, which was also built by the Morgan Construction Co. This bed is 44 ft. wide and 80 ft. long and built of heavy rolled steel sections capped with cast iron wearing plates. Billets are pushed across this bed by means of tilting go-devils, placed every 6 ft., and moving at a speed of 188 ft. per minute to

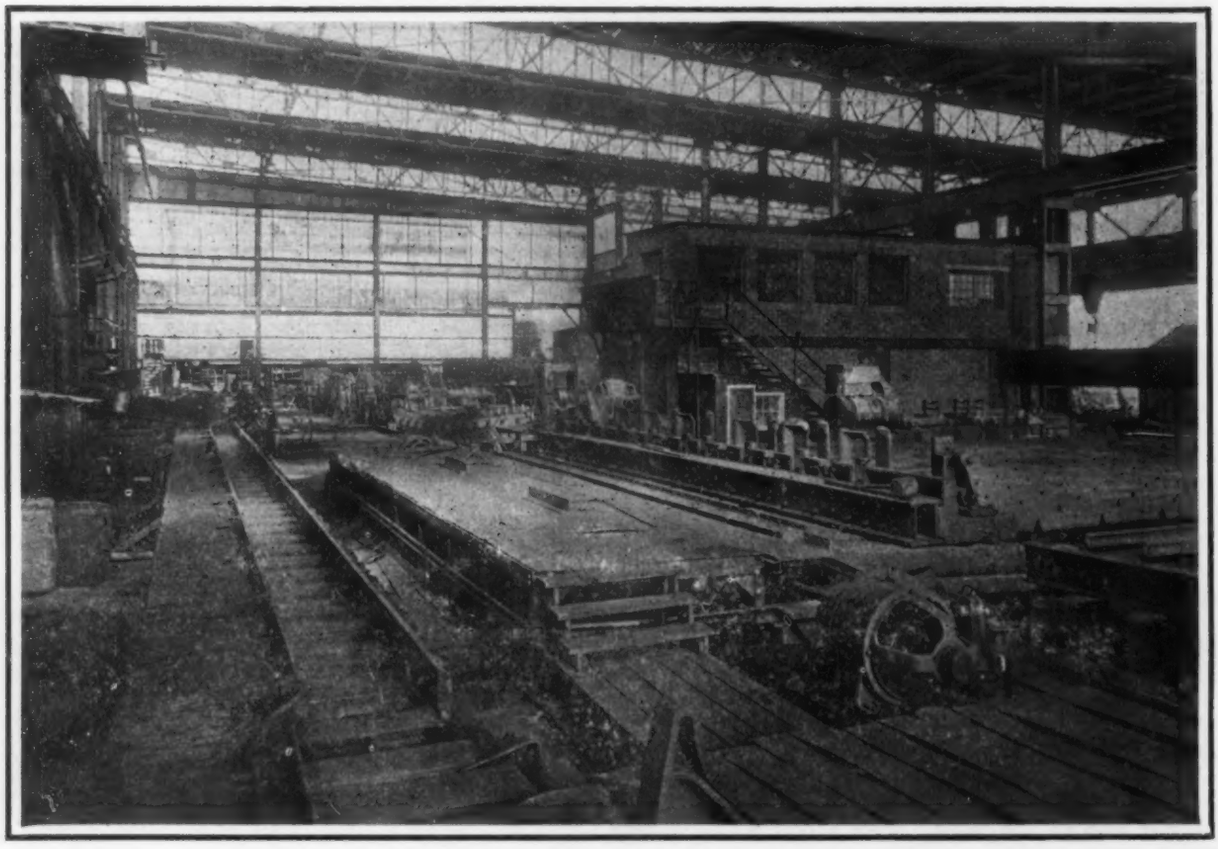


Fig. 3—Removable Bar Piler to Which the Pinch Rolls Deliver the Sheet Bars

a piling bin located in the adjoining building, in which the billets are weighed and then transferred to storage.

The 18-in. mill building is 103 ft. 4 in. wide by 717 ft. long. In the lower end are located the sheet bar shears and picklers, which conveniently serve the furnace aisle of the sheet mill building.

In order to provide power to drive this mill and to take care of contemplated extensions, a 10,000-kw. turbogenerator, built by the Westinghouse Electric & Mfg. Co., was installed, together with two Stirling boilers of 823 hp. capacity equipped with Westinghouse underfeed stokers. All of the necessary piping was supplied by the American Foundry & Construction Co., Pittsburgh, and the pipe covering by the H. W. Johns-Manville Co.

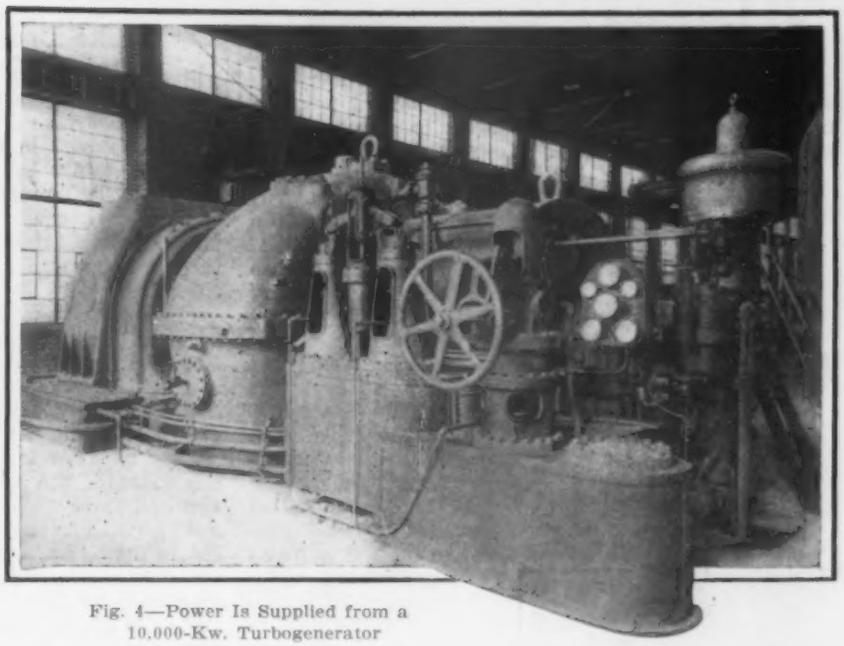


Fig. 4—Power Is Supplied from a 10,000-Kw. Turbogenerator

JOHN FRITZ MEDALIST

Presentation to Sir Robert A. Hadfield in London This Week

A feature of the engineering conference of the Institution of Civil Engineers at its opening session in London, June 29, was the presentation of the John Fritz medal to Sir Robert A. Hadfield, Bt., D.Sc., D.Met., F.R.S. As has already been told in these columns, a deputation from the four national societies of civil, mining and metallurgical, mechanical and electrical engineers of the United States crossed the ocean recently to make, in connection with the presentation to Sir Robert Hadfield, formal expression of "the obligation which the United States and the world generally owe to the engineers of Great Britain for the part they played in winning the war."

At the annual meeting of the John Fritz Medal Board of Award held Jan. 21, 1921, Sir Robert was unanimously chosen the medalist for the year 1920, the medal being awarded to him for the invention of manganese steel. The deputation appointed to make the presentation in London consisted of Ambrose Swasey, chairman of the John Fritz Board of Award; Dr. Ira N. Hollis, president Worcester Polytechnic Institute; Charles T. Main, of the American Society of Civil Engineers; Dr. F. B. Jewett, of the American Institute of Electrical Engineers; Charles F. Rand, of the John Fritz Board of Award and chairman of the Engineering Foundation; Christopher R. Corning and Col. Arthur S. Dwight, representing the American Institute of Mining and Metallurgical Engineers, and John R. Freeman, past president of the American Society of Mechanical Engineers.

Sir Robert Hadfield is one of the best known of British metallurgists and steel manufacturers and no man has had greater prominence in recent years in the scientific and engineering societies of Great Britain. He was Master Cutler of Sheffield in 1899, president of the Iron and Steel Institute 1905-1907, of the Society of British Gas Engineers 1917-1918, of the British Commercial Gas Association 1919-1920, and of the Faraday Society 1914-1920. Numerous medals have been awarded to him, chiefly for his discoveries in alloy steels, particularly the invention of manganese steel, the Bessemer gold medal being awarded to him in 1904. Four other awards were made by the Institute of Civil Engineers. Previous awards in the United States were of the John Scott medal and premium and the Elliott-Crescent gold medal, both by the Franklin Institute. In France three gold medals were awarded him by the Society for the Encouragement of National Industry.

Robert A. Hadfield was born at Sheffield, Nov. 29, 1859, and entered the laboratory at his father's works in Sheffield in 1876. His work in metallurgy includes the discovery and invention of manganese steel in 1882, and later the discovery of low hysteresis steel. He has been chairman and managing director of Hadfields, Ltd., since 1888. His contributions to the proceedings of engineering and scientific societies have been important and voluminous. He has been indefatigable in research and is probably not rivaled in the range of his acquaintance with contemporary literature in iron and steel. His presidential address before the Faraday Society in 1914 on "Advances in the Metallurgy of Iron and Steel" was a notable paper, as was his presidential address before the Iron and Steel Institute in 1905. He has had closer contact with American developments in the iron and steel industry than any of his British contemporaries.

In connection with the award made to him in London this week Sir Robert Hadfield submitted an address covering the history of the John Fritz medal, the work of the United Engineering Society in the United States, references to manganese steel and its application, a general statement concerning his own research work, with a final section dealing with the history and work of the Royal Society. A set of Sir Robert's engineering papers and presidential and other addresses has been made up for transmission to the Engineering Societies Building, New York, to be permanently available for inspection and reference.

Joseph G. Butler, Jr., Honored

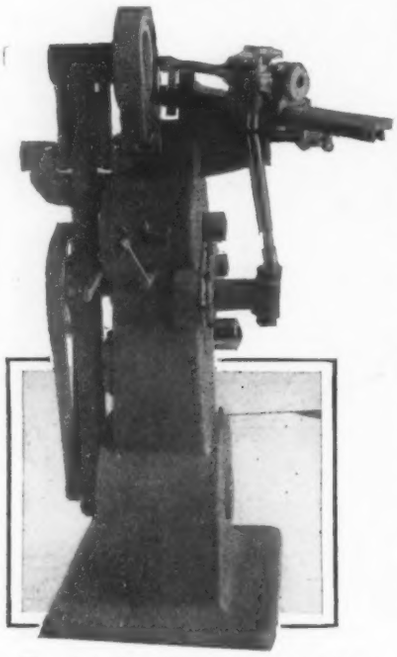
In appreciation of the efforts of Joseph G. Butler, Jr., steel manufacturer of Youngstown, Ohio, in behalf of the community, the Youngstown Federation of Women's Clubs has presented a bronze tablet of Mr. Butler to the city. It has been placed in the Butler Art Gallery, which Mr. Butler erected and equipped with a collection of paintings at a cost of $600,000. The tablet bears this inscription: "To honor our eminent citizen, Joseph G. Butler, Jr., contributor to the advancement of our communal life, liberal patron of the fine arts for the people, the Youngstown Federation of Women's Clubs places this tablet."

The Federal Trade Commission has changed the time for resumption of hearings in the so-called ferromanganese anti-dumping case to Tuesday, July 12. It had previously decided to resume them to-day or to-morrow, but the date was changed because the commission is moving its New York office, where the proceedings are to be held, from 20 West Thirty-Eighth Street to 105 West Fortieth Street.

New Drill Grinder

A new design of drill grinder, automatic in operation and said to produce a specially shaped point of unusual penetrating ability and endurance has been developed by the Oliver Instrument Co., Adrian, Mich.

The accompanying illustration shows the general construction. The drill holder is a rotating spindle with a hole to receive standard taper sleeves, the nose of the spindle being threaded for a chuck for holding straight shank drills up to 1½ in. in diameter. The spindle is located at an angle to the grinding wheel and is revolved by means of gearing. The drill is inserted in the spindle as for drilling, the only adjustment required being to set the lip horizontally by means of a gage provided for the purpose. The spindle bearing is adjustably mounted on a guide to accommodate different lengths of drills, the guide being attached to a slide which can be moved by a feed screw.



The Grinding Wheel Has an Oscillating Movement, the Grinding Wheel Arbor Revolving in Ball Bearings Mounted in an Oscillating Cradle

The grinding wheel is mounted to give an oscillating movement, the grinding wheel arbor revolving in ball bearings mounted in an oscillating cradle. The cradle also has an axial movement controlled by a cam in the body of the machine. The movements are so related that the wheel traverses the cutting lip of the drill until the point of the drill approaches the periphery of the wheel, the drill remaining stationary. At this point the drill revolves automatically and the wheel moves forward. This motion is said to have the effect of increasing the lip clearance toward the center of the drill and forms the heel clearance, also cutting out the metal in front of that part of the chisel point where the drill lip usually drags. This has the effect of assisting the chisel point to cut rather than rub and is said to greatly increase the penetrating ability of the drill.

After the lip is set horizontally against the lip gage the drill is brought in contact with the wheel by turning the feed screw and the wheel oscillates and the drill rotates in contact with the wheel. The drill point is in plain sight of the operator and two, three or four lips may be ground by moving a handle to the proper position on a segment, with no adjustment necessary for drills of different sizes. The machine stops automatically in the proper position for setting the drill so that the relative motions of the wheel and drill cannot change.

Belt or motor drive may be furnished, the motor being housed in a dust proof compartment in the base, and running at 1750 r.p.m. The machine occupies 20 x 20 in. floor space, its height being 52 in., and the overall length parallel to the slide, 32 in.

The committee on welded rail joints of the Electric Railway Association, realizing that the use of electrically welded joints on the tracks of street railroads is becoming quite common and that it is important to know as fully as possible the characteristics of the welded metal, has asked the Bureau of Standards, Washington, to participate in organizing a program of research in connection with tests of various types of welding as related to street railroad practice.

Coke Breeze and Coal as Fuel

Tests were recently made by the Bureau of Mines to determine the steaming value of coke breeze as a fuel when mixed with Pittsburgh coal. A No. 60 Smith boiler was used in the test. The fuel burned was a mixture of coke breeze from the by-product ovens of the Jones & Laughlin Steel Co. and Pittsburgh run-of-mine coal, equal weights of each being mixed together before firing. The calorific value of the mixtures was between 8 and 16 per cent less than that of the coal.

Two tests were made with a mixture of a coarser grade of coke breeze and coal, the first of which was run at about 31 per cent of the boiler rating and the second at 71 per cent. With the mixture containing the finer breeze, one test was run at about 34 per cent, and the other at 45 per cent of the boiler rating.

The result of the test showed that the mean steaming value of the mixture of the coarser coke breeze and coal to be about 80 per cent of that of Pittsburgh lump coal, anthracite and screened coke. At the low rating the mixture of finer coke breeze and coal evaporated the water as efficiently as the coarser mixture, but its efficiency fell so rapidly at a slightly increased rating that it is doubtful whether its mean steaming value is more than 70 per cent of Pittsburgh coal over the same range of steaming rate as the range quoted for the coarser mixture. The above figures are only approximate, as the calorific value of both the coal and the coke breeze vary.

Smoke density readings showed that the coal emitted nearly three times as much smoke as the coarser coke breeze and coal mixture, at the higher rate of steaming, and nearly twice as much at the lower rate. At the lower rate the finer coke breeze and coal mixture emitted about one-fourth less smoke than the coal and about one-third more than the coarser coke breeze and coal. At the 45 per cent rating it emitted 16 per cent less smoke than at the lower rating.

Iron and Steel Production in Canada

Statistics of the production of iron and steel in Canada for the month of March, just issued by the Dominion Bureau of Statistics, Ottawa, show an increase in pig iron and a decrease in steel ingots and castings. The total output of pig iron in March was 60,443 tons compared with 57,711 tons in February, and 41,000 tons in January last. At the end of March, only five furnaces were active and 15 idle. The production of steel ingots and castings was 53,050 gross tons in March, compared with 58,547 in February and 40,000 in January. The Bureau of Statistics says: "Very little comment of an encouraging character can be made on the iron and steel situation in Canada at the present time. It seems nevertheless true that if the present uncertainty continues for an indefinite period, the accumulated needs of the steel-working and construction industries may become such as to create better market conditions for the steel trade." At the present time, however, conditions in the pig iron and iron and steel markets of the Dominion are growing worse instead of improving.

Railroad Building in Belgian Congo

WASHINGTON, June 28.—Considerable railroad construction and development in the Belgian Congo is planned for the near future, according to a report made to the Bureau of Foreign and Domestic Commerce. The road from Matadi to Leopoldville is to be reconstructed at a cost of 10,000,000 francs. The Katanga railroad is to be extended northward from Bukama to a less obstructed portion of the Lualaba River at a cost of 30,000,000 francs and 20,000,000 francs are to be expended on the construction of the first Belgian portion of the Benguella railroad. The port of Bomba and the Mayumber road will be improved at a cost of 8,000,000 francs, while 25,000,000 francs will be devoted to the purchase of railroad material for the Great Lakes railroad.

James A. Campbell Calls for Quick Action

President of Youngstown Sheet & Tube Co. Predicts Men Out of Work Will Become Bolsheviki Unless Something Is Done—Fears Return to Government Ownership of Railroads

PRESIDENT JAMES A. CAMPBELL, Youngstown Sheet & Tube Co., and A. E. Adams, president First National Bank and vice-president of the Electric Alloy Steel Co., Youngstown, Ohio, were the principal speakers June 21 at the regular monthly meeting of the Pittsburgh Purchasing Agents' Association. The association conducted a special factory visitation trip to the General Fireproofing Co. and the Republic Rubber Corporation during the day. About 200 members participated, traveling between Youngstown and Pittsburgh on a special train via the Pittsburgh & Lake Erie Railroad.

Purchasing agents of Youngstown industrial companies arranged the entertainment, among them S. H. Hedges, Republic Iron & Steel Co.; C. Y. Farrell, General Fireproofing Co.; Carl A. Ilgenfritz, Brier Hill Steel Co.; F. J. Laskey, Newton Steel Co.; R. J. Pike, Pennsylvania-Ohio Electric Co. and J. R. Stroh, Brier Hill Steel Co. Officers of the association are G. W. Sanborn, United Engineering & Foundry Co., president; S. E. VanVranken, Locomotive Stoker Co., first vice-president; J. E. Stauffer, A. M. Byers Co., second vice-president; W. G. Scott, R. D. Nuttall Co., third vice-president; H. Llewellyn, Pittsburgh Steel Products Co., treasurer and Frank T. Adams, Carbo-Hydrogen Co., secretary.

Business Situation Serious

Mr. Campbell stated that the business situation was now more serious than anyone had thought it would be several months ago and pointed out the necessity of definite action if it is to be improved. He said the country would gradually right itself, but that this would take two, three or four years "if we let it work out its own way. Men out of work will turn bolshevik in seeking for a change unless something is done in the meantime. Nothing will help but a quick adjustment of wages and freight rates. If we delay we are doing great injustice to ourselves and to our workers who are walking the streets. We may get Government ownership of the railroads if the situation doesn't improve." He stated that he had wired the President opposing the Freylinghuysen coal stabilization bill and urging Mr. Harding's own slogan of "less government in business and more business in government." President Sanborn of the association later informed the audience that the organization had adopted resolutions against the Freylinghuysen bill, which had been communicated to Congress.

Competing with Europe

Mr. Campbell emphasized the absence of foreign trade, the improbability of any revival in that quarter for some time and the handicaps being imposed upon American industry by competing with low-priced labor in Europe. "In Germany and France to-day common labor is being paid 10 to 12c. per hr. and skilled labor 15c. Germany is starting to get on her feet and is trying to do her best to get into the world market. We can't hope to compete with German steel makers on the present basis of costs and in a measure we don't want to. We have to give them a start. I would be sorry to see wages lowered to the continental standard in America. At the same time, I am opposed to a high tariff wall, which will keep up our present wages and prices. What we want is a fair tariff under which the people can get the benefit of competition to which they are entitled." In this connection he stated that the Consolidated Steel Corporation recently reported that Germany had offered certain finished steel commodities in Japan at $20 per ton below the lowest American quotation.

Reasonable Freight Rates

Mr. Campbell said all interests agree that we must have equitable and reasonable freight rates in this country or business will not be profitable. He insisted that lower freight rates, permitting movement of commodities over the long hauls in this country and to seaboard points for export at fair charges, are fundamental to any attempt to correct existing conditions. "The farmers are actually on strike," he stated. "They will not and in many instances cannot buy. A large share of the sales price of the commodities goes to transportation and the minor share to the farmer. The farmer buys 45 per cent of the goods manufactured in the United States and the railroads transport 40 per cent of their total tonnage from the farmer. We must get freight rates reduced on farm products, food and basic commodities before we can get on an equal basis."

Proposed Remedies

He proceeded to read parts of a draft of the remedies to be suggested by him and associates to Congress and President Harding. He enumerated the following four items and said others will follow:

First—Abolish completely agreements made during Federal control by the Railroad Administration, made up largely of union representatives and interests identified with the railroad unions.

Second—Restore to the individual railroads the right to negotiate wages, classification of employees and working conditions. He condemned the present tripartite control of the railroads by the managers, the interstate commerce commission and the labor board.

Third—Repeal the Adamson law, defined as a war measure to give more wages to railroad workers and as such a detriment to the equalization process which must be started to revive industry.

Fourth—Prevail upon the Government, in settling with the railroads for repayment of advances made during the war for betterments, to fund the amount so that it may be paid in 15 annual installments.

Do Away With Labor Board

"We can't start industry until we are on an equal basis," Mr. Campbell de lared. "Do away with the labor board, which is nothing but a perpetuation of Government control. Give the railroads free hand to settle their disputes with their employees. Railroads should not be forced to pay nationalized wages. It is unfair to them and unfair to industries in the communities they serve. Railroad wages must be governed by conditions in various localities and should not be higher or lower than prevailing wages of industry in communities which they serve. It is unjust, unfair and unequal to pay a railroad laborer $3 or $4 per day in Alabama, where the prevailing wage is $1.50 per day, and to pay the same wages in highly congested industrial districts, such as Pittsburgh and Youngstown.

"I believe it is our duty, yours and mine, to shorten the time of the depression by going to the contributory causes and trying to find remedies for them. The quicker we can have a crisis the better. Our men are walking the streets and continued unemployment will make them want a change. Hungry men always want a change. They will turn to bolshevism and jump from the frying pan into the fire. We all know what bolshevism has done in Russia. We don't want it here. Our difficulties would work out in the course of a few years, but we can't wait, we have to act.

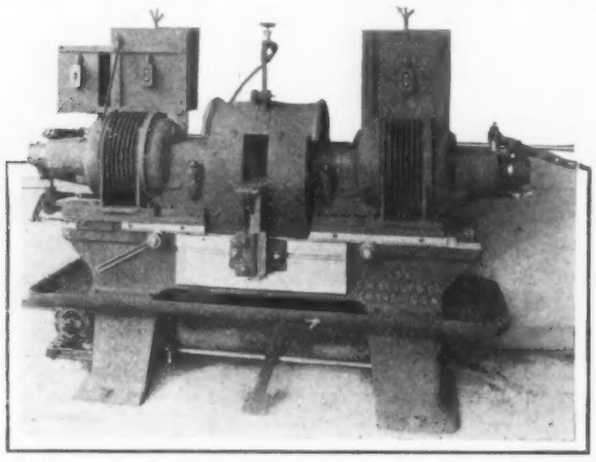
"It's no use 'pussyfooting' any longer. It is no use simply knowing where the trouble is and what the remedies are. Knowledge alone will not help. We have to go to the Government and we have to go to Congress and insist that they act. We have to face the issue squarely. We must have the courage of our convictions. Truth hurts, but so does the knife of the surgeon who saves the life of the sick man. Business

(*Continued on page* 1796)

Motor Driven Ring Wheel Grinder

The direct motor driven heavy pattern ring wheel grinder shown in the accompanying illustration has been recently put on the market by Charles S. Besly & Co., Chicago. The machine is of the regular double spindle Besly type for grinding both sides of a piece parallel simultaneously and a previous model was described in THE IRON AGE of June 25, 1914.

The motors are 7½ hp., 900 r.p.m., alternating current, special grinder type, fully enclosed. Push button control is provided, and the starters are attached direct to the motor frame and mounted in a dust proof case. The motors are mounted on a bed plate and are moved along the bed of the machine base by rack and pinion,



Maximum Opening Between Ring Wheels Is 10 In. The height from floor to center of spindle is 39 in. and floor space occupied, 50 x 96 in.

permitting accommodation for the various widths of work. The motors are moved, however, only when changing from one width of work to another, as the spindles themselves slide endwise feeding the wheels to the work being ground. The spindle movement is through rack and pinion to which both hand and foot lever are attached. The movement is actuated on both spindles through a connecting rod attached to a lever at the rear of the machine. The connecting rod can be disconnected if desired and the right hand spindle locked stationary, leaving the left hand spindle to be operated to and from the work through foot lever movement. A pull spring attached to a lever at the rear of the machine is drawn out when the spindles are moved to the work and when the foot or hand lever is released the spring returns the spindles to the starting position.

Endwise movement is controlled by micrometer stop screws attached to each of the outer bearings. When the wheels are brought up to the work and the piece ground to the required depth, the micrometer screws are set so that they come in contact with the bearing head casing, making a positive stop to the endwise movement of the spindle.

The bearings are extra heavy phosphor bronze castings, the thrust being taken on a flange of large area. This flange is equipped with a hardened steel thrust collar and the thrust bearing is automatically oiled from the ring oiling bearings themselves. The oil reservoirs are large and the oil rings of large diameter.

The accompanying illustration shows the machine with plain work rest, but rocking, swinging or sliding rests can also be used. The machine carries two pressed steel ring-wheel chucks, 18 in. in diameter, into which can be set ring wheels 18 in. in diameter, with grinding faces varying from 1½ to 4½ in. Disk wheels 20 in. in diameter can be used.

A golf club is being organized by members of the Machinery Club of Chicago for the purpose of holding several tournaments at various golf courses in and near Chicago during the summer. The membership fee is $6, which will be used to pay expenses and furnish prizes. The Golf Committee in charge consists of D. R. Hoffman, chairman, F. A. Adkins and A. G. Bush.

Decreased Production in the Connellsville Region

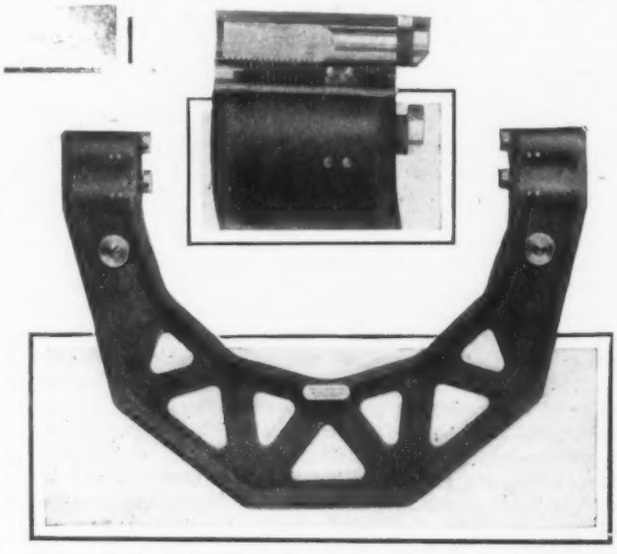
UNIONTOWN, PA., June 27.—Conditions in the Connellsville bituminous coal region are approximately at a stalemate. Production continues to show a decrease. During the past week, approximately 300 ovens were added to the inactive list. All Frick ovens are banked, as they have been for a month.

It is admitted that resumption is delayed further than had been expected. No forecasts are now made. The principal handicap, it is believed, is readjustment in the railroad situation.

Efforts on the part of operators and brokers in the region to stimulate buying have fallen flat and they are now sitting back awaiting the turn in the market, which will undoubtedly bring a higher price range. Coal quotations have dropped to $1.65 with upward range as regards classification. A few sales of coke have been made under $3 by operators who had the coke on the tracks and wanted to dispose of it.

Trus-Form Snap Gages

Fifteen sizes of trus-form adjustable limit snap gages, having an extreme range of from 0 to 12-in., embodying new features, have been placed on the market by the Pratt & Whitney Co., Hartford, Conn. The gages derive their name from the fact they are built along the lines of a roof-truss. The frame of triangular cells, flanges and ribs being in tension or compression, is light and stiff. The outer rib with its broken lines gives a sure grip, even when oily.



Anvils Are Provided with Two Opposed Set Screws for Making Fine Adjustments. Anvil faces are lapped before assembly

The anvils are provided with two opposed set screws which pull in opposite directions like the screws of an independent lathe chuck. By pulling one against the other the finest adjustment, positive in either direction, is easily made. When both are tight the anvil is secure against "shake" in any direction, cannot be jarred loose, and is readily sealed.

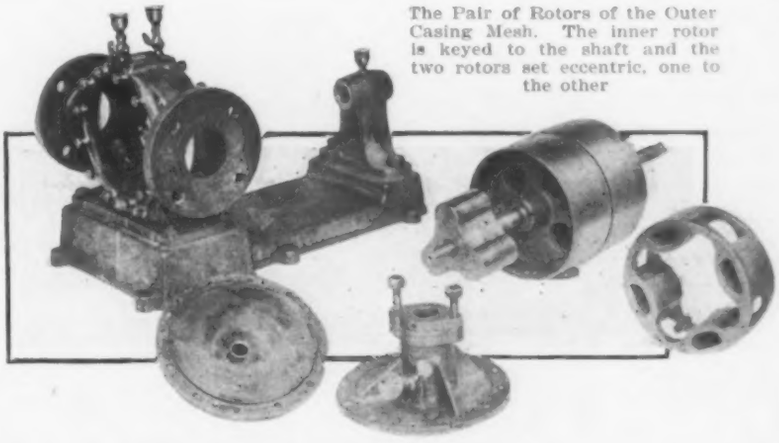
The anvils work in holes accurately line-reamed. The anvil faces are lapped square before assembling, consequently except for the most exacting work, no lapping after assembling is necessary. The anvils are interchangeable and in sizes larger than ½-in. have heads which permit of gaging to within 1/32-in. of a shoulder. In the smallest sizes, as an extra, two special anvils with offset heads may be used in the "go" positions when it is necessary to work close to a shoulder. These anvils are not needed in "no go" positions.

Two pairs of brass buttons are secured by through-screws, for marking sizes, tool numbers, operation numbers, etc., as provided. These are readily removed to a bench-plate for stamping, and may be filed off and re-marked. One pair may be used for any permanent marking and secured by riveting over or soldering the point of the screw.

New Type of Rotary Pump

The Exeter rotary pump (Feuerheerd patents) has been developed by the Exeter Machine Works, Inc., West Pittston, Pa., and is claimed to be based upon an entirely new idea of rotary pump construction. The pump creates its own suction, its action is positive, and the flow is continuous. Broadly speaking, the underlying principle is a variant of the square hole drilling device in which a triangular bit functions, inside a restraining square former of equal size. This combination has been developed as a 3-tooth gear meshing with an internal 4-tooth gear set eccentrically one to the other. The irregular spaces increasing and diminishing in volume, as the two rotate together, are utilized to admit and eject the fluid.

The pump consists of an outer casing of cylindrical form having a pair of rotors meshing, the inner rotor being keyed to the driving shaft. These two rotors are set eccentric one to the other. The outer rotor has four ports which are open to the chamber of both the suction and discharge side of the pump during rotation. These ports are closed momentarily by a lip at both the top and the bottom of the pump body in order to effect the cut-off between the suction and the discharge of the pump. The liquid is drawn into the pump through the ports of the outer rotor while the pocket is increasing, and forced out at the opposite side of the pump during the last half revolution when the pocket is decreasing.



The Pair of Rotors of the Outer Casing Mesh. The inner rotor is keyed to the shaft and the two rotors set eccentric, one to the other

The rotors are flat castings of suitable thickness, their faces being in parallel planes. The outer rotating member is a working fit in the casting at its periphery and is otherwise free, the inner rotor imparting motion to the outer.

The pump is self-priming, easy of installation and is said to be adaptable to almost every pumping condition. Dirt and grit do not seem to affect the pump inasmuch as there is no rubbing or wearing contact. They are especially suitable for pumping water for irrigation, barometric condensers, suction roll work, evaporation pans, for boiler feed, circulating, lubricating or wet vacuum work, and for handling oil, molasses, mine water, tar, chemicals, paints, turpentine, gasoline, soaps, etc.

Smaller pumps thus far tested have shown a sustained volumetric efficiency of 98.67 per cent, and a pumping efficiency of between 70 and 82 per cent.

The Cincinnati Chapter of the American Society for Steel Treating, at their June meeting to be held at the plant of the R. K. LeBlond Machine Tool Co., June 30, will be shown moving pictures illustrating the manufacture of Armco ingot iron from raw materials to finished product. T. W. Jenkins, of the American Rolling Mill Co., will deliver a lecture. A constitution and by-laws for the chapter will also be submitted.

In a decision rendered at Chicago on June 21 the United States Railroad Labor Board upheld the contention of union leaders that the Pullman Co. had not observed "the letter and spirit" of the transportation act when it conferred with its employees in mass meetings. The board threw out the company's petition for a cut in the wages of its shop employees and instructed it to go back and meet the "duly elected representatives" of the men.

LAKE COAL RATES

Railroads Will Probably Modify Reduction—Opposition to Frelinghuysen Bill

WASHINGTON, June 28.—Indications are that the railroads will modify the 28c. reduction in lake cargo coal rates in such a way that they will apply only on coal moving by rail from the upper lake ports. The effect would be that the rates will be proportionals for movement beyond. The primary object in making the 28c. reduction was to enable the Eastern coal operators to get into the Northwest more nearly on an equality with the operators of Illinois and Indiana.

Protest was made against the adjustment by steel interests using by-product coal in ovens south of the Illinois-Wisconsin lines and others. It was contended by these consumers that advantage would be given pig iron makers at Duluth, Minn., and Milwaukee.

The movement of lake cargo coal at a 28c. reduction in freight rate has been pointed to as an argument in favor of the Frelinghuysen bill in the Senate to establish coal rates, but opponents to the bill state that there is a wide difference between the two situations. One of the chief points made is that the lake cargo coal largely is stimulated not only because of the lower rate, but because it must be moved before lake navigation closes. Opponents of the measure have cited various instances of lowered seasonal coal rates, especially in the West, where they resulted in no benefit to domestic consumers. Among those opposing not only the Frelinghuysen bill to establish seasonal rates and the one to stabilize the coal industry is Senator Pomerene of Ohio. He has inserted telegrams in opposition to the measures, one of them coming from President James A. Campbell of the Youngstown Sheet & Tube Co., which reads as follows:

"We are large purchasers of coal, having bought last year about 2,000,000 tons. We strongly oppose Frelinghuysen bill to regulate coal industry. It is contrary to President's pre-election statement of less Government in business and more business in Government. Its passage would discourage all lines of industry. Business requires relief from interference, not further repression. Would regard passage of this bill as a bad precedent."

Senator Frelinghuysen contended that "regulation" is not intended in the legislation. Senator Pomerene replied that the telegram probably was not written from the standpoint of the lawyer, but rather from the standpoint of the business man and said that he agreed that in the ordinary acceptation of the term neither bill could be regarded as regulatory in character.

The Westinghouse Electric & Mfg. Co. is installing a new wireless station at its plant at Springfield, Mass., and similar plants will be placed in service at the Newark, N. J., works, and at Cleveland. With completion of the installation it will be possible for the company to handle wireless communications from its East Pittsburgh headquarters to any of these plants.

The Inland Steel Co. will discontinue the basic 8-hr. day at its plant at Indiana Harbor, Ind., effective July 1. This eliminates time and one-half paid for time worked in excess of eight hours per day.

Automatic Heat-Treating Furnaces

Charging, Treating, Quenching and Drawing Performed and Governed by Automatic Devices Easily Set

BY GILBERT L. LACHER

AUTOMATIC electric furnaces for the heat treatment of automobile forgings, recently installed by C. H. Wills & Co., Marysville, Michigan, are said to represent the latest development in equipment for the heat treating of automobile forgings. It is stated that Wills & Co. will subject all of their forgings to scientific heating treatment in electric furnaces. It has been announced that molybdenum steel will be largely used in the manufacture of the Wills Sainte Claire car.

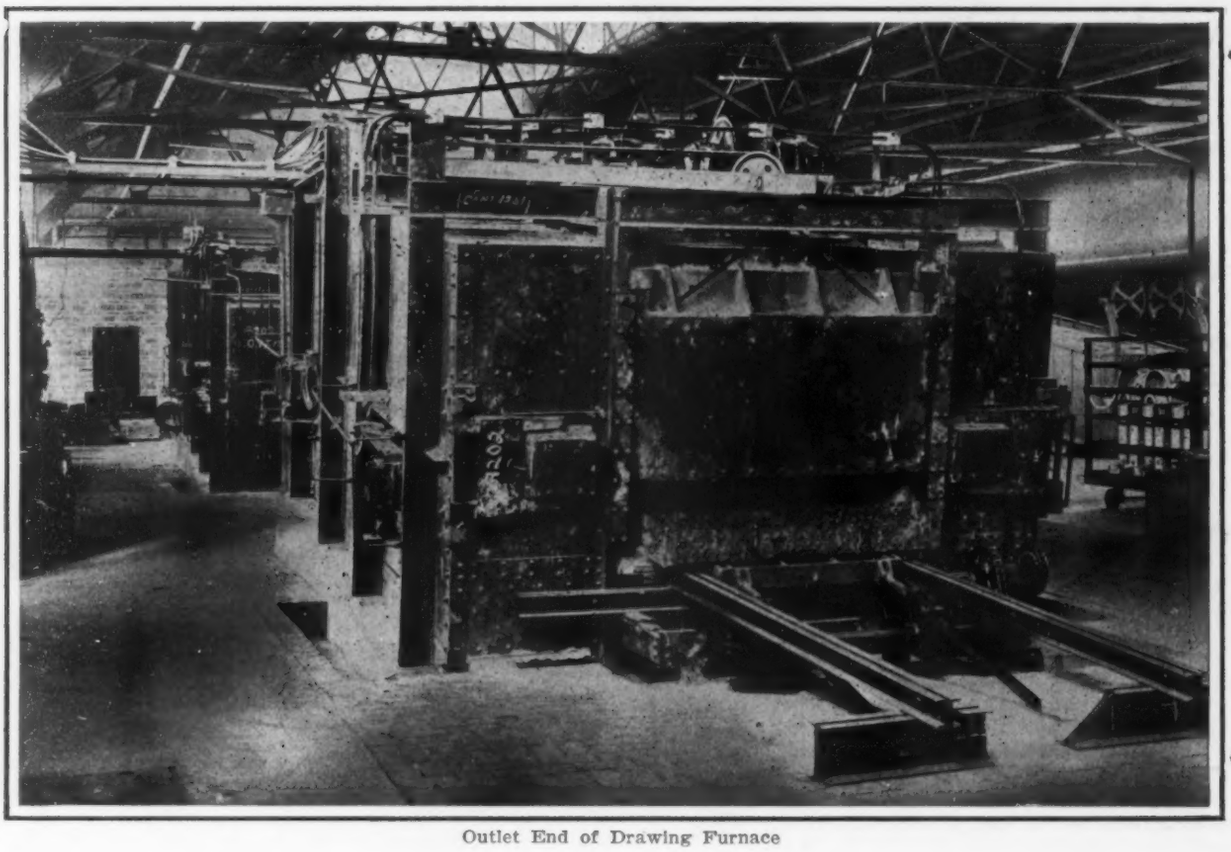
With exact control of time and temperature, guess work is eliminated from heat treating and the physical properties of steel can be developed to the maximum. When the desired treatment has been determined, the equipment is set for the proper time and temperature for the furnace, and there is also a simliar automatic regulation of the quenching operation. Then, without the need of a skilled operator, the furnace will repeat any heat treatment on a tonnage basis as long as desired.

Built by the Electric Furnace Co., Alliance, Ohio, this heat-treating equipment consists of a set of two similar electric furnaces, each with a hearth substantially 5 ft. wide and 15 ft. long, having an electrical capacity of 400 kw. for the combined unit, and a heat treating capacity of 1500 lb. per hr. As the material to be treated consists of a large number of parts of different size, ranging from axles and crank shafts down to the smallest parts entering into the construction of the car, it was necessary, to get the most convenient operation, to place all the material in pans or containers. The parts remain in these pans through the hardening and quenching operations and through the drawing operation as well.

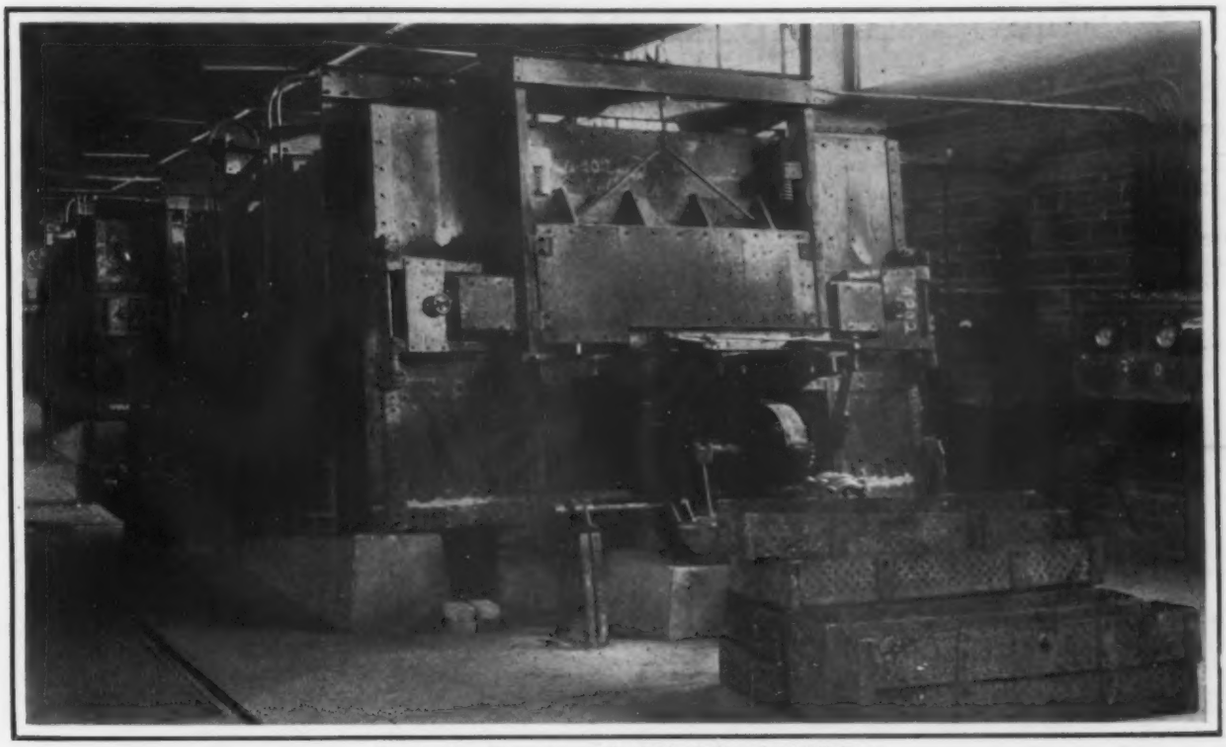
Electric motors, actuated by a time-clock mechanism, raise and lower the furnace doors, advance the material through furnaces and quench, and make it unnecessary to have any conveying mechanism within the hot zone of the furnaces. The entire equipment is "fool proof." The only manual operation is the placing of the material on the charging platform. The treatment the forgings will receive never depends on the chance judgment of the operator. Rejections, due to faulty treatment, are thus entirely eliminated.

A loaded container is placed on the charging platform before the pusher of the hardening furnace; the equipment is set for a given treatment, and when the pan nearest the discharge end of the furnace has received this treatment the doors automatically open, the cold pan is then pushed into the furance, and all the pans within are moved along so that the last pan is discharged into the quench. The hearth is inclined 15 deg. to minimize this push, and prevent the crushing of the furnace pans.

The automatic quenching equipment has a counterweighted carriage which butts against the discharging door of the hardening furnace. When this door is raised the carriage slides in and receives the outcoming loaded pan. This added load overcomes the effect of the counterweight, and the carriage slides down into the quenching tank. Here the loaded pan is caught on a conveyor, and the carriage, relieved of its burden, rises and again butts against the furnace door until another pan of material is ready to be discharged. The first pan remains in the quenching tank for the fixed length of time, and then the conveyor mechanism carries it up on to the drain board, or, if desired, bears it direct to the charging platform of the drawing furnace.



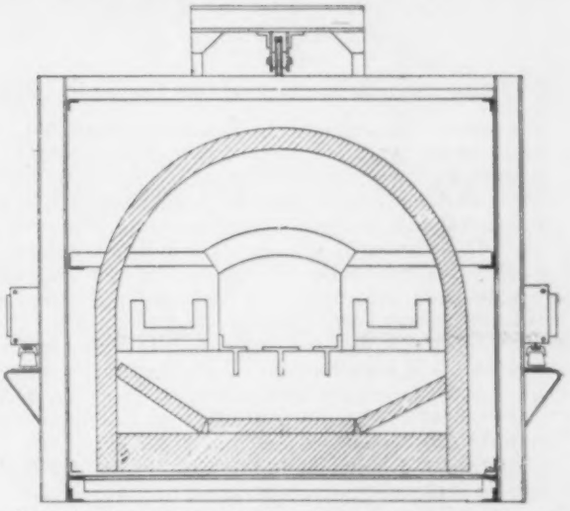
Outlet End of Drawing Furnace



Hardening Furnace, with Control Panel at Right

The drawing furnace operates in exactly the same manner, except that the material is discharged to the air. Unless the equipment is set for a different treatment, the same process will be exactly repeated every day.

The heating principle of these furnaces is very simple. Carborundum troughs are placed lengthwise on either side of the furnace hearth. These troughs are connected outside the furnace to special oil switches and these switches are, in turn, connected to the transformer taps corresponding to the power input and temperature desired. Closing a switch passes a low voltage current through the carbon in the trough and quickly brings this carbon to incandescence. The heat thus generated is radiated from the bottom of the trough underneath the elevated hearth, from its sides direct to the hearth, and from the top of the trough to the roof and thence reflected to the hearth. This results in a large source of relatively low temperature heat, uniformly distributed throughout the furnace.



Cross Section of Furnace, Showing Carborundum Heating Troughs

Automatic Quench Between Furnaces

FOUNDRY PIG IRON STOCKS

Co-operation of the American Foundrymen's Association with Secretary Hoover

W. R. Bean, of the Eastern Malleable Iron Co., Naugatuck, Conn., who is president of the American Foundrymen's Association, has sent a letter to its members in furtherance of the effort of Secretary Hoover to collect statistics of production and stocks in the iron and steel industry. Mr. Bean represented the association at the conference on iron and steel statistics held in the office of the Secretary of Commerce on May 18.

Co-operation of the American Foundrymen's Association was sought with a view to getting statistics of stocks in the hands of users of pig iron. Following the Washington conference, President Bean laid the matter before the board of directors of the American Foundrymen's Association and later it was discussed at the meeting of the association's executive committee held in New York, May 28. At that meeting the following resolution was adopted:

"That it is the sense of our executive committee that our association lend its moral support to Secretary Hoover in any ways possible, consistent with its purposes and in conformity with its by-laws, in his efforts to extend the field of usefulness of the Department of Commerce to industry and business; and specifically to offer our co-operation in the efforts now being made to establish a monthly statistical report on the iron and steel industry, including stocks, production and other data, by sending a letter to all interested members urging their participation by supplying the requisite data monthly to the Department of Commerce; and further that we accompany the letter by a return card on which to signify their willingness or unwillingness to supply the data, we to tabulate the returns and communicate them to Secretary Hoover."

In pursuance of the above action President Bean has sent out to the membership of the American Foundrymen's Association a card on which the recipient company is asked to indicate whether it would be willing to give information as to its capacity for the production of castings, also its rate of operation each month. Each firm was also asked to sign the following:

We are willing, if the merchant furnace pig iron producers will supply similar data, to co-operate with Secretary of Commerce Hoover by supplying monthly a report of pig iron on hand at the end of the month and pig iron used during the month.

Thus far the question of reporting pig iron stocks at furnace yards has not been taken up with the producers of pig iron, but it was the understanding of those who attended the conference at the Department of Commerce on May 18 that the department would communicate with the various associations of pig iron producers with a view to securing their co-operation in the collection of such statistics.

Old Material Will Not Have to Be Broken

Hereafter iron and steel to be used as scrap will not have to be broken previous to shipment in order to be transported at scrap freight rates. It will be necessary only to offer the railroad inspectors sufficient proof that the material will be remelted and not reused in present form. This change is the result of a recent ruling of the Official Classification Committee of the railroads and applies to that territory east of the Mississippi River and north of the Ohio and Potomac rivers. It is believed that the Western and Southern Classification committees will take similar action, thereby causing a uniform ruling over the United States. The change in ruling was advocated by the National Association of Waste Material Dealers.

The Official Classification Committee has issued the following instructions to carriers:

For a number of years past we have carried in official classification a note in connection with scrap iron and steel reading:

Ratings apply on scraps or pieces of iron or steel having value for remelting purposes only.

Recently an interpretation of the word pieces was made, we finding that articles entitled to the scrap iron rating had to be broken up into pieces or scraps. Numerous protests have been filed thereto on account of its literal application by the Inspection Bureau, especially in connection with such articles as kettles, rolling mill rolls, shells, car wheels, etc., account of shippers having no available means of breaking the articles into pieces, as result of which we have ruled that where shipments are offered as scrap iron or steel, and charges have been assessed at the rating for the specific article, that if it is proven to the satisfaction of the terminal line that the shipments had value only for remelting purposes and are actually melted the scrap iron ratings would apply thereto.

This question has been prominently before us lately in connection with steel shells sold by the United States Government for remelting purposes, and on which we held that the ratings established in the Official Classification under the caption of ammunition, not explosive, for projectiles, empty or sold, other than small arms, would apply.

We are advised that these shells are without copper rotating bands, base covers, detonators, screws or disks, in other words, that as shipped they are not shells and cannot be used as such, but have value for remelting purposes only and in fact are remelted.

Having these facts in mind, we hold that if such shipments are billed as scrap iron or steel shells, having value for remelting purposes only, or even as scrap shells, that the rating established in Official Classification for scrap iron or steel may properly be applied thereto.

Bids on Pig Iron for Navy

WASHINGTON, June 28.—The following bids have been received by the Bureau of Supplies and Accounts for 446 gross tons of foundry pig iron, 1.25 to 1.75 per cent silicon; 89 gross tons of 78 per cent ferromanganese, and 22 tons of 50 per cent ferrosilicon, all for the Washington Navy Yard:

Pig iron: Donner Steel Co., $21.50, furnace; Thomas Iron Co., $24, furnace; Bethlehem Steel Co., $26.96, delivered; Empire Steel & Iron Co., $28, delivered; Crocker Bros., $31.90, delivered.

Ferromanganese: C. W. Leavitt & Co., New York, $72.80; Frank Samuel, Philadelphia, $74.59; E. W. Marshall & Co., Philadelphia, $74.81; Crocker Bros., New York, $78.40; E. J. Lavino & Co., Philadelphia, $84; Vanadium Corporation of America, $88.36.

Ferrosilicon: Donner Steel Co., Buffalo, $70, furnace; Crocker Bros., $78.40, delivered; Vanadium Corporation of America, $87.80, delivered; Shawinigan Products Co., $80, delivered.

Will Reorganize Birmingham Steel Corporation

BIRMINGHAM, ALA., June 28.—The Birmingham Steel Corporation, against which creditors some time ago filed a petition in involuntary bankruptcy, will be reorganized, settle with the Government, disassociate itself from the Mobile Shipbuilding Co. and operate as an independent steel fabricating interest. Creditors have asked for withdrawal of their petition in bankruptcy. The corporation claimed all along to be solvent and that seems apparent. Delay of settlement with the Government, which financed the building of the plant during the war, caused the embarrassment and misconception.

Link-Belt Co. Buys Caldwell Company

The Link-Belt Co., Chicago, has acquired the capital stock of the H. W. Caldwell & Son Co., Chicago, and Frank C. Caldwell has been elected a director of the former company. As a result, the Link-Belt Co. has added two new lines to its manufactures, helicoid conveyors and power transmission machinery. There will be no change of name nor of officers.

American Society for Testing Materials

Cast-Iron Car Wheels and Chemical Requirements — Annual Meeting Also Discusses Magnetic and Impact Testing — Changes in Specifications

THE sessions on iron, steel and non-ferrous metals of the American Society for Testing Materials at its twenty-fourth annual meeting were concentrated in the last day of the four-day convention held last week at Asbury Park, N. J., June 20 to 24. The sessions were all held at the New Monterey Hotel, this being the second annual meeting to be held at this place. All the sessions were well attended. In fact the registration this year was but little under that of a year ago, the total being 771 against 801 last year. Of the attendance this year, 131 were ladies against 141 a year ago, while 640 male members and guests were registered as compared with 658 in 1920.

Some of the Original Papers on Steel and Iron

A NUMBER of valuable original papers were presented which were intermingled with the regular reports of the many important committees on specifications. Although they were few in number, they were decidedly interesting as presenting new light on the subjects treated. Papers pertaining to foundry matters, cast iron and steel, and to magnetic and shock testing were leading ones.

Chilled Cast-Iron Car Wheels

The chilled cast-iron wheel and specifications therefor was by far the most lively topic of the iron and steel sessions. The matter was taken up at the Friday evening meeting and was introduced by Dr. Richard Moldenke, who presented the report of committee A-3 on cast iron. The principal feature of this report, which is treated more in detail in the account of committee reports, was the recommendations regarding specifications for cast-iron wheels. Proposed tentative specifications for cast-iron wheels, A 46-21 T, were submitted in the usual manner. There had been, however, no little difficulty in settling on the chemical specifications, a matter which has caused trouble before. Doctor Moldenke, in offering the report, submitted suggested chemical specifications which had been arrived at after the last meeting of the committee, based on new information. They included:

	Per Cent
Combined carbon	0.50 to 0.85
Manganese	0.50 to 0.75
Sulphur	0.18 maximum
Phosphorus	0.30 to 0.40
Silicon	0.45 to 0.75

By a vote of the society the report of the committee was adopted, including the above suggestions as to chemical requirements in the printed tentative specifications.

Dr. Moldenke's report was followed by the reading of a paper by H. J. Force, chemist and engineer of tests, Delaware, Lackawanna & Western Railroad, Scranton, Pa., entitled "Some Failures of Cast Iron Wheels," which is printed substantially in full elsewhere in this issue. The author prefaced his paper by saying that in 1913 the total loss by railroads due to accidents of all kinds was about $33,000,000; in 1919 this had grown to $106,000,000. A large part of this, too large a portion, he said, was due to damage to freight caused by derailment accidents with the principal cause ascribed to poor iron car wheels. "By no means are the car wheels as a whole satisfactory."

Discussion of this paper and the specifications was general and impressive and was participated in by prominent members of the Association of Manufacturers of Chilled Car Wheels. The discussion was opened by G. E. Doke, engineer of materials, New York Central Railroad, Cleveland, who advocated some such specifications as offered by the committee or by Mr. Force. He was sure that proper chemical composition would result in better wheels and he laid emphasis on the need of a thermal test in such specifications, citing cases of wheels containing 1.02 per cent combined carbon which failed in 150 sec. and wheels of 1.26 per cent combined carbon which failed in 100 sec. in such a test.

Testimony of Car Wheel Makers

George W. Lyndon, president Association of Manufacturers of Chilled Car Wheels, which represents 25 companies having a capacity of 25,000 car wheels per day, expressed the interest of his association in any proposition to improve wheels and declared his belief in chemical specifications. He said he could not recommend those of Mr. Force because of the difficulties which would be encountered by Pacific Coast and Southern car-wheel makers in getting material to meet these. He mentioned the fact that the association had an electric furnace in its research laboratory for studying this and other problems and assured the society if it adopted chemical specifications, they would be submitted to the members of the association and carefully passed on.

F. K. Vial, consulting engineer of the car wheel association and of the Griffin Car Wheel Co., said that he felt the combined carbon proposition and the depth of chill were so important that they should be included in any specifications; that the vital part was a proper balance in the specifications with the combined carbon below 0.85 to 0.90 per cent and with the manganese three times the sulphur content at least—conditions not always found to exist.

H. E. McClumpha, National Car Wheel Co., and Mr. Courtney, New York Car Wheel Co., heartily recommended the specifications proposed and said their companies were making wheels to such specifications and would continue to do so. H. C. Brown, Brown Car Wheel Co., also approved the specifications by saying that his company had been making wheels to meet these for some time but that a phosphorus limit of 0.32 per cent as a maximum was best.

Electric Refining for Car Wheels

Doctor Moldenke dealt on the necessity for increased quality in car wheels and referred to the recommendations of Mr. Force concerning the presence of nickel and chromium in one set of his suggested rules. If such elements are included, Doctor Moldenke felt they should be introduced in the original pig iron and not by means of alloys or otherwise. He also called attention to the necessity of watching cupola practice and asserted that, by the use of the basic electric furnace in conjunction with the cupola, desired results as to composition and refinement could be obtained by direct action. He raised the question as to what Southern makers could do to meet a specification of 0.30 to 0.40 per cent phosphorus when their pig iron already runs 0.50 per cent.

Robert Job, vice-president Milton Hersey Co., Ltd., Montreal, Canada, testified that in his experience the combined carbon in failed car wheels has exceeded 0.90 per cent, the phosphorus 0.30 and the sulphur 0.15 per cent. He believed proper specifications, such as those of the Lehigh Valley Railroad, should include combined carbon 0.50 to 0.75 per cent with 0.85 per

cent as a maximum; manganese, 0.50 to 0.70 per cent with phosphorus at 0.30 per cent as a maximum and sulphur with 0.16 per cent as an upper limit.

C. T. Ripley, of the Santa Fe system, declared that cracked plates were a serious consideration; that 10 years ago chemical specifications were not a governing factor, and that the two main reasons for failed wheels were cracked plates and slag inclusions. He recommended the arch plate wheel which in his experience had cut failures down to one-tenth for cracked plates. He emphasized the need to consider the kind of service to which wheels are subjected in judging their value because of the rough manner in which trains are often handled. He favored the proposed specifications but suggested they include the arch plate wheel.

Dr. G. B. Waterhouse, Lackawanna Steel Co., Buffalo, N. Y., suggested that, from a steel man's point of view, the proposed specifications would tie down makers too closely particularly in limiting the silicon content but this was answered by others who said they were making wheels successfully to such specifications.

Impact Tests of Steel Castings

A series of interesting dynamic tests on various grades of cast steels was embodied in a paper by F. C. Langenberg, Metallurgist, Watertown Arsenal, Watertown, Mass., entitled "Impact Tests on Cast Steel" and presented at the morning session on Friday. In the absence of the author it was abstracted by John Howe Hall, Taylor-Wharton Iron & Steel Co., High Bridge, N. J. The paper is based on some experiments conducted at the Watertown Arsenal to clean up some disputed points.

Four separate experimental investigations are reported upon by the author, the first three covering steel castings and the last treating of impact tests on forged steel submitted for comparison with the results obtained from castings. The first investigation consists of a number of tests on the effect of phosphorus on the properties of Tropenas cast steel which showed that a high phosphorus content greatly impaired the Charpy values. The second set deals with Tropenas steel castings, having a high manganese content, up to 1.75 per cent. A surprising increase in Charpy values with certain manganese contents was reported. The third series of tests covered the effect on Charpy and other values of varied heat treatments of acid open-hearth steel castings.

In the brief discussion of this paper, Prof. H. F. Moore, University of Illinois, Urbana, Ill., raised the question as to what the significance of the results of Charpy tests really is since the conditions under which they are conducted represent abnormal service conditions and bear no correlation to repetition tests of steel at low stresses.

Strength of Steel at High Temperatures

A paper, "Comparative Tests of Steels at High Temperatures," by R. S. MacPherran, chemist, Allis-Chalmers Mfg. Co., West Allis, Wis., was also presented at the Friday morning session. The tests recorded were made to ascertain the comparative properties of various steels at high temperatures to obtain information as to the best material for use under operating conditions of 600 to 1000 deg. Fahr. Carbon and alloy steels, both rolled and forged, were used. The paper gives in detail the apparatus employed for heating test pieces already placed on the testing machine. The tests do not warrant any definite conclusions, says the author, but they throw light on the subject and indicate that further consideration should be given to the properties of various alloy and carbon steels at high temperatures.

A written discussion offered by H. J. French, U. S. Bureau of Standards, and A. P. Spooner, Bethlehem Steel Co., Bethlehem, Pa., gave an account of similar tests made at his plant. Herman A. Holz, Holz & Co., Inc., New York, read an extensive criticism and résumé of work done by various investigators on this subject which will be printed more in full in an early issue of THE IRON AGE. C. W. Gennet, Jr., Robert W. Hunt & Co., Chicago, called attention to the importance of microscopic analysis in such work, tensile tests alone not being enough.

Magnetic Testing of Springs

The testing of springs magnetically was treated by T. Spooner and I. F. Kinnard in a paper "Magnetic Spring Testing," which was presented in abstract at the afternoon meeting of Thursday, June 23. A summary follows:

Following the work of C. W. Burrows and others demonstrating that there is a close correlation between magnetic and other physical properties of materials, experiments were carried out by the authors looking toward the practical application of this relation. These experiments were performed chiefly to devise simple and rapid magnetic testing equipment. This paper is intended to describe such apparatus and to give results of a number of magnetic tests on helical steel springs. From the results of these tests the following conclusions may be drawn:

1. The leakage method of test offers little promise of usefulness for this class of material unless the supplier is furnishing an especially non-uniform product, particularly since it will not detect longitudinal seams or cracks.

2. The hysteresis method of test furnishes a ready commercial method of checking the quality and heat treatment of the finished springs.

3. The retentivity, B_r, furnishes the most satisfactory indication of the physical condition of the material. Moreover, this test is an extremely simple one to make.

4. This method of test gives both the spring user and the spring manufacturer a quick and simple method of determining the quality of the completed springs without destroying any material.

5. The magnetic values given in this paper can be applied only to material of the same cross-section and chemical composition. With the same chemical composition and heat treatment, quite different physical and magnetic properties would be obtained for material having a much different cross-section.

In the brief discussion, Dr. Burrows suggested, among other things, the value of applying this method of testing to springs during their actual life. F. P. Fahy, consulting engineer, New York, complimented the authors as having covered a happy application of magnetic analysis but thought they had used an unfortunate title whose scope would be misunderstood and offered as a substitute the "Magnetic Testing of Springs" which was referred to the authors.

Other papers presented include: "A Test for Shock Strength and Hardened Steel" by C. E. Margerum, metallurgist United States Naval Ordnance Plant, South Charleston, W. Va.; "Methods of Casting Manganese-Bronze Test Bars As a Check on Merits of Small Castings" by E. H. Dix, Jr., which gives the results of a series of experiments made in the foundry of the engineering division of the air service at McCook Field, Dayton, Ohio, and "Some Mechanical Properties of Hot-Rolled Monel Metal" by P. D. Merica, R. G. Waltenberg and A. S. McCabe, research department, International Nickel Co., Bayonne, N. J.

Reports of the Principal Iron and Steel Committees

AS most of the real work of the making and altering of specifications of the society is done by committees, their reports constitute one of the most important parts of each session's program. Most of the iron and steel committees held several meetings during the year as well as during the convention and submitted important reports. The chief points in those relating to iron and steel are as follows:

Committee A-1 on Steel

The report of Committee A-1 on Steel was submitted at the Friday morning session by its chair-

man, F. M. Waring, engineer of tests Pennsylvania System, Altoona, Pa. He announced that F. P. Gilligan of the Society of Automotive Engineers had been made a member of sub-committee 10, while A. L. Colby had been appointed the society's representative on the corresponding committee of the automotive engineers. Representatives of the society had also been established to work with the American Bureau of Welding. The chairman also announced that two new sub-committees had been appointed during the year; sub-committee XIII on methods of testing and sub-committee XVIII on nomenclature and definitions. The committee has also approved the appointment of a third new sub-committee, XIX on steel sheets. The function of this committee is to be the preparation of specifications for steel sheets of any and all grades for which there appears to be a demand.

Regarding the much discussed question of phosphorus and sulphur in the society's specifications, the chairman announced that the committee had given careful consideration to the note concerning these two elements which, by action at the last convention, had been allowed to remain attached to 14 specifications and that the committee had recommended that this note be removed from all specifications and that the sulphur requirement be raised 0.01 per cent in four specifications and the phosphorus requirement for acid steel be raised 0.01 per cent in one specification.

In explanation of these recommendations, the chairman pointed out that of the 14 specifications that now carry the note, the note affects the phosphorus in Bessemer steel in the specifications for rails, splice bars, reinforcement bars, tie plates, track bolts, and the Bessemer grade in structural steel for buildings. The recommendation to remove the note from these specifications will require manufacturers to work to the original phosphorus limit for Bessemer steels.

Of the remaining specifications, three cover rivet steel, original sulphur 0.045 per cent; also the specifications for boiler tubes and seamless tubes call for sulphur 0.045 per cent. The effect of this recommendation would be to require manufacturers to adhere to the original 0.045 limit. Sulphur for steel chain was specified at 0.05 per cent and this would again become the limit.

As against these changes cutting off the extension for sulphur and phosphorus, it is felt, stated the chairman, that the extension in sulphur from 0.05 to 0.06 per cent in the three classes of structural steel must be retained due to the heavy tonnages involved and to the continued difficulty in obtaining low sulphur fuels and melting stock. The recommendation to continue the extension of both phosphorus and sulphur in steel castings is made in the belief that the same difficulties with fuel and melting stock exist in this industry.

Sulphur and Phosphorus in Steel Castings

The chairman reported that the movement which originated in the American Society for Testing Materials for a comprehensive survey of the effects of phosphorus and sulphur in steel castings is well under way in the hands of a large and representative joint committee working under the chairmanship of the Bureau of Standards. Our society, he said, is looking to that investigation for final advice as to suitable limits, but until the work is completed it is believed that the changes now recommended may be made with safety.

The committee recommended the revision of the heat treatment clauses in the specifications for steel forgings and billets. At present forgings are allowed to become cold after forging, and it is recommended that this be changed to read that forgings be allowed to cool only to a temperature below the critical range in order to prevent damage.

The complete report presents numerous revisions in standard specifications and also proposed revised specifications for welded and seamless steel pipe as well as proposed tentative specifications for carbon steel rails and cold-drawn steel wire for reinforcing.

The report of committee A-3 on cast iron was presented by its chairman, Dr. Richard Moldenke. Two matters of importance, said the chairman, have been considered by the committee during the past year, one of which is a revision of the existing standard specifications for cast-iron car wheels. The matter has received extended study since the close of the war and the committee submitted to the society newly revised specifications for cast-iron car wheels with the request that they be accepted as tentative. Details of the presentation of this part of the report and a discussion of the chilled cast-iron steel problem in general are included in the earlier part of this report of the convention. The final action of the society was the adoption of the tentative specifications.

"High-Test" Iron for Semi-Steel

The other work, said the chairman, is in connection with the general sentiment among engineers and foundrymen that the misleading appellation of a very useful form of cast iron—so-called "semi-steel"—be done away with and the material itself be standardized so far as this may be accomplished by definite specifications for the physical properties usually designated. "The addition of steel scrap to foundry mixtures," says the report, "dates back to the civil war and, through the reduction of the total carbon thereby, the strength of the resulting castings is enhanced considerably. The improvement is, however, one of degree and depends upon the percentage of low-carbon steel scrap added and equally upon the metallurgical skill of the foundryman. Necessarily, the tendency to charge high prices for the product exists, whether much or little steel has been used, etc. It was recognized by the committee that two things must be done to accomplish the desired reform: First, find a suitable designation for comparatively low-total-carbon gray-iron castings; and second, draw the line somewhere which will distinguish them from the ordinary classes of specification product. A name has been tentatively adopted for the want of something better, in 'high-test' cast iron and your committee is very earnest in inviting the members of the society who have experience with this class of castings to improve upon the designation here given. Sentiment against the word 'semi-steel' as even a trade designation was unanimous. Specifications for this 'high-test' cast iron are now under consideration and it is hoped will be worked out during the coming year."

Wrought Iron Pipe Specifications

The report of committee A-2 on wrought iron pipe was presented by its chairman, H. E. Smith. He stated that the committee has cooperated with committee A-1 in writing new specifications for tubes which include both steel and charcoal iron tubes and has approved those portions of them which apply to iron tubes. The combined specifications were presented by committee A-1. The specifications for welded wrought iron pipe have been revised to make certain minor requirements conform to similar sections in the tentative specifications for steel pipe as revised. The committee has also prepared a consolidation of the specifications for staybolt iron, engine bolt iron and extra refined wrought iron bars as a change in form only, for the sake of economy in publication. Hollow staybolt iron is now quite generally used for certain parts of locomotive boilers, and according to the committee's reports, needs recognition. Separate specifications have been written and submitted.

Rules on Heat Treatment

The report of committee A-4 on heat treatment of iron and steel was presented by John H. Hall, Taylor-Wharton Iron & Steel Co., High Bridge, N. J., in the absence of its chairman, Prof. H. M. Boylston. The committee during the year has been reorganized and enlarged to a membership of 21 and has appointed five sub-committees having to deal respectively with the following subjects: Heat treatment of rolled and forged carbon steel; heat treatment of steel castings; heat treatment of alloy steel; case hardening and heat treatment of case-hardened objects; heat treatment of wrought iron. The two latter committees have not yet been organized and the committee on heat treatment of steel castings reported progress in revising

the specifications, while the sub-committee on heat treatment of rolled and forged carbon steel was reported as having held one meeting.

The report of committee A-5 on corrosion of iron and steel was presented by Dr. Allerton Cushman, Washington, D. C., in the absence of the chairman. It is voluminous and contains details of the progress of the corrosion tests in various localities in the country which have been going on for some time. The mass of details presented reveals the large amount of work which has been done by the various sub-committees of the committee during the year.

The report of committee D-6 on coke, Dr. Moldenke, chairman, states that the membership has been enlarged by the appointment of new members especially qualified for work on physical specifications for blast furnace coke, and that a sub-committee on this subject is now being organized and tentative methods for conducting shatter tests and hardness tests are in preparation for trial tests by the committee.

In presenting the report of committee E-4 on metallography, the chairman called attention to the organization of four sub-committees on selection and preparation of samples; on nomenclature and definitions; on thermal analysis and on photography. George F. Comstock, Titanium Alloy Mfg. Co., Niagara Falls, N. Y., was elected secretary. The committee has prepared and offers for acceptance tentative methods for metallographic testing of iron and steel which are intended to replace the corresponding methods now appearing in sub-division V of the standard methods of testing. The committee has also prepared and offered for acceptance tentative definitions of terms relating to metallography to be used with standard definitions and rules governing the preparation of micrographs of metals and alloys. He announced that methods for metallographic testing of non-ferrous alloys will be taken up with the idea of submitting tentative standards at the next annual meeting.

In the absence of the chairman, the report of the committee B-2 on non-ferrous metals and alloys was submitted by Dr. Paul D. Merica, International Nickel Co., Bayonne, N. J. The work of the committee during the year was described as consisting in the preparation of specifications covering nickel and of methods for the chemical analysis of nickel, aluminum and light aluminum alloys.

All committee reports were adopted after the usual presentation and brief discussion.

Some Failures of Chilled Cast-Iron Wheels*

Important Factor in Railroad Accidents—Chemical Specifications Declared Necessary and Tentative Ones Recommended

BY H. J. FORCE

THE cast-iron wheel has a marvelous history. Today the commerce of the nation depends upon it. Approximately 26,000 000 chilled-iron wheels are now in use in the United States and Canada, serving under freight cars, passenger coaches, refrigerator cars, engine tenders, city street cars, interurban cars and electric locomotives. Eighty to ninety per cent of all the equipment in the United States and Canada is equipped with cast-iron wheels. The annual production in the United States is approximately 3,000,000 wheels, some of which are exported to France, Russia, Italy and other foreign countries. A large proportion of the total production is required for repairs.

*Table 1—Wheels Worn Out in Service**

Mark	Cast	Graphitic Carbon	Combined Carbon	Phosphorus	Sulphur	Manganese	Silicon
A	9-20-15	2.32	0.99	0.360	0.154	0.49	0.70
B	6- 2-16	2.77	0.75	0.308	0.136	0.66	0.73
C	7- 2-13	2.18	0.98	0.304	0.155	0.55	0.65
D	8-24-12	2.15	0.93	0.260	0.122	0.43	0.59

*All values in per cent.

It may be asked why chilled-iron car wheels have proven so satisfactory, when other parts of car, track and structure have been superseded by other and more expensive materials. This is due to the character of the metal, for no other material has been made able to make any serious inroad on the chilled-iron wheel for the past 70 years.

It is the object of this paper to point out such recommendations and changes as are thought to be necessary in the chilled-iron wheel. It is well known that during the past few years railroad cars have been loaded to greater capacity; heavier equipment has been placed on many lines; many roads are using rails much heavier than a few years ago; roadways are rock ballasted, and are very largely equipped with tie plates. This rigid track construction has placed a greater duty upon the chilled-iron wheel, a condition which the manufacturers possibly may not have realized, for little effort has been made to improve the quality of the wheels to meet these conditions.

The cast-iron wheel is about the only part of railroad equipment which is not purchased to a chemical specification; yet it is the most important part of such equipment. The failure or breakage of one wheel in a train almost invariably results in derailment. Such chemical specifications as have been recommended are not generally acceptable both to the manufacturer and the consumer. It is generally conceded that unless an improvement is made in the quality of cast-iron wheels, the railroad lines will be forced to give careful consideration to the use of steel wheels, with the hope that fewer failures will result in service. From a study of the service condition of cast-iron wheels, we are of the opinion that this wheel can be greatly improved, and that it will be found to be satisfactory under nearly all equipment. It has been claimed that the ordinary wheel on certain lines is satisfactory. This may be true where such lines do not have any lengthy and heavy grades, but where these grades do exist failures from cast-iron wheels are constantly resulting; and as all class of equipment is handled over these lines, it is therefore necessary that the wheels on all lines be made of the best possible composition.

*Table 2—Wheels Failed in Service**

Mark	Cast	Graphitic Carbon	Combined Carbon	Phosphorus	Sulphur	Manganese	Silicon
1	8-27-17	2.24	1.01	0.420	0.176	0.57	0.70
2	.....	2.13	1.23	0.430	0.191	0.41	0.82
3	.....	2.46	0.89	0.440	0.200	0.65	1.06
4	4-15-18	1.87	1.50	0.384	0.182	0.39	0.75
5	5-28-13	2.19	1.14	0.388	0.199	0.52	0.75
6	3-28-18	2.10	1.24	0.386	0.146	0.36	0.76
7	6-28-20	1.91	1.31	0.354	0.193	0.52	0.80
8	8-21-19	1.99	1.21	0.384	0.261	0.67	0.88
9	3-14-18	2.24	0.95	0.364	0.171	0.50	0.84
10	3- 9-20	2.15	1.19	0.428	0.185	0.52	0.69
11	10-13-17	2.16	1.03	0.408	0.138	0.38	0.70
12	9- 3-19	2.24	1.08	0.370	0.197	0.60	0.76
13	12-30-18	2.34	0.98	0.420	0.175	0.79	0.73
14	.....	2.14	0.98	0.420	0.219	0.72	0.93
15	2-17-15	2.20	1.12	0.400	0.190	0.43	0.68

*All values in per cent.

During the year 1920, 42 failures occurred from broken wheels on the lines of the Lackawanna Rail-

*From a paper presented at the twenty-fourth annual meeting of the American Society for Testing Materials at Asbury Park, June 24, 1921. The author is chemist and engineer of tests, Lackawanna Railroad Co., Scranton, Pa.

road and, with very few exceptions, these were on foreign cars. For 1921, 20 failures have occurred which caused derailment.

Four wheels were selected from a number of wheels which had been worn out and marked A, B, C, and D. Table 1 shows the date each wheel was cast, and gives the composition. It will be noted that in most cases these wheels meet the requirements of the specifications recommended later, although no effort apparently was made to make the wheels to any specification. The table shows the fact that the composition as to phosphorus and sulphur, and especially silicon, is fairly satisfactory. It should also be pointed out that the wheel with the lowest sulphur and lowest phosphorus apparently gave the best service. The higher silicon wheels in all cases showed more wear than lower silicon wheels. On the other hand it is believed that the combined carbon content, which in one case is as high as 0.99 per cent, is outside the limit for a cast-iron wheel which would give the best service.

Table 2 shows a list of wheels which failed in service and in each case caused a serious derailment. Note

*Table 3—Chemical Analyses of Wheels from Three Foundries**

Foundry	Graphitic Carbon	Combined Carbon	Phosphorus	Sulphur	Manganese	Silicon
B	2.58	0.79	0.320	0.157	0.57	0.70
	2.70	0.79	0.350	0.143	0.53	0.67
	2.47	0.83	0.320	0.143	0.61	0.69
	2.56	0.63	0.340	0.157	0.59	0.73
	2.68	0.77	0.370	0.164	0.54	0.77
	2.78	0.57	0.350	0.144	0.52	0.72
	2.83	0.51	0.340	0.142	0.50	0.77
	2.86	0.51	0.360	0.158	0.48	0.74
A	2.63	0.77	0.290	0.158	0.54	0.63
	2.55	0.61	0.350	0.153	0.68	0.64
	2.53	0.73	0.300	0.142	0.57	0.74
	2.94	0.61	0.290	0.130	0.59	0.76
	2.84	0.53	0.270	0.141	0.56	0.69
	2.94	0.48	0.300	0.148	0.54	0.75
	2.69	0.62	0.296	0.144	0.52	0.76
N	2.65	0.85	0.320	0.148	0.52	0.65
	2.57	0.90	0.330	0.132	0.49	0.71
	2.41	0.76	0.280	0.141	0.60	0.63
	2.36	0.79	0.330	0.132	0.59	0.68
	2.49	0.80	0.320	0.134	0.61	0.66
	2.56	0.75	0.320	0.130	0.55	0.64
	2.51	0.70	0.330	0.134	0.58	0.72
	2.56	0.73	0.292	0.142	0.52	0.70
	2.60	0.75	0.292	0.125	0.58	0.75
	2.46	0.81	0.296	0.137	0.60	0.71
	2.50	0.79	0.286	0.140	0.52	0.72
	2.55	0.77	0.300	0.126	0.57	0.74
	2.75	0.51	0.304	0.135	0.53	0.67

*All values in per cent.

here the high combined carbon, high phosphorus and uniformly high sulphur, in some cases low manganese, and in many cases high silicon. Wheels of this composition should not, under any circumstance, be placed in service. Some of these wheels gave very little service, and we feel safe in saying that the wheels described in this table were shipped without the knowledge of the manufacturers as to their chemical composition.

Table 3 shows our analyses on a number of wheels made on different dates by three different wheel foundries, the majority being cast in 1920. Under foundry B, which was asked to furnish wheels with not over 0.35 per cent phosphorus, it will be noted there is considerable high phosphorus. This we might say was their first attempt to make wheels to a chemical specification. The same request was made of foundry A, and in this case all wheels conform to the specification as to phosphorus. In foundry N effort was then made to have the wheels contain not over 0.32 per cent phosphorus. It will be noted that in every case the wheels conform very closely to the specification, and it is felt that no undue hardship will be imposed upon the wheel makers to have phosphorus not over 0.32 per cent and that a better and safer wheel will in every case be made.

It is not contended that a chemical requirement will at once eliminate all wheel failures, for it is possible that an occasional wheel will fail in service from inferior composition due possibly to some oversight on the part of a workman in the foundry.

In order to show the necessity for chemical requirements in a specification, we call attention to an analysis of 252 wheels from 28 different foundries that were being removed in our shop in the ordinary routine of operation. No selection whatever was made; the wheels were taken just as they came into the shop to be removed for the various causes cited below:

Cause of Removal	Number of Wheels	Average Life
Brake burns	21	5 yr. 1 mo.
Cracked plates	61	4 yr. 5 mo.
Seamy rims	31	6 yr. 11 mo.
Worn flanges	56	7 yr. 8 mo.
Worn through chill	4	7 yr. 2 mo.
Shelled out	33	6 yr. 6 mo.
Seamy treads	4	4 yr. 0 mo.
Slid flats	35	3 yr. 4 mo.
Chipped rims	7	8 yr. 1 mo.
Total	252	5 yr. 5 mo.

The average life of these 252 wheels was 5 years and 5 months. The total percentage of cracked plates in this lot is approximately 24 per cent. Taking this as an average, the total number of wheels removed for cracked plates during a period of 12 months on the Lackawanna Railroad would be approximately 8000.

In our judgment, the cracking of plates is due very largely to inferior chemical composition. Seamy rims and seamy treads are as a rule due to foundry practice and are usually the result of metal being poured at too low a temperature. Immediate improvement in both manufacture and composition of cast-iron wheels is necessary.

It is recommended that the question of drop test and thermal test be carefully investigated. We believe these tests should be made as severe as possible, so that none but good wheels may be shipped.

The Association of Manufacturers of Chilled Car Wheels, representing a large number of manufacturers throughout the United States and Canada, have given assurance that they are anxious to lend all possible assistance in the production of a first-class wheel. We are therefore recommending the following specification, covering all weights of chilled iron wheels:

Specification "A"

	Per Cent
Total carbon	3.00 to 3.65
Combined carbon	0.45 to 0.85
Manganese	0.50 to 0.75
Phosphorus	Not over 0.32
Sulphur	Not over 0.17
Silicon	0.45 to 0.75

It is felt that the heavier wheels which are now being recommended will tend to reduce failures.

It is recommended that special consideration be given to a wheel which contains a small percentage of nickel and chromium, as indicated in specification B. Wherever wheels of this composition have been used, the results have been highly satisfactory; they should be suitable for the heavier equipment. The increased cost of these wheels will run from 7 to 10 per cent.

Specification "B"

	Per Cent
Total carbon	3.20 to 3.75
Combined carbon	0.40 to 0.80
Manganese	0.45 to 0.65
Phosphorus	Not over 0.15
Sulphur	Not over 0.17
Silicon	0.45 to 0.70
Chromium	0.10 to 0.25
Nickel	0.10 to 0.20

Every wheelmaker understands that while his metal may be of the proper composition, an inferior wheel can be produced due to faulty foundry practice, such as allowing wheels to be cold when pitting, or maintaining pits in improper condition. However, if the foundry practice is correct and the wheels are of the proper chemical composition, there is every reason to believe that a good, safe, cast-iron wheel can be produced. The drop and thermal tests, together with an examination of the fracture and depth of chill, usually reveal the method of foundry operation.

The majority of the failures of wheels previously cited occurred near the bottom of long, heavy grades, probably due to the elevated temperatures which the wheels attained. In nearly all cases failure occurred by rupture of the plate, and it is important, therefore, that the composition be controlled so that as much strength as possible may be obtained and the wheel enabled to withstand these elevated temperatures.

With the increase in weight of the wheel, the heavier plates and thicker flanges, there is good reason to believe that the cast-iron wheel will serve the railroads of the United States for many years.

Drop Forge Convention at Chicago

Economic Outlook Discussed—Relative Merits of Board and Steam Hammers, Electric and Oil Fired Heating Furnaces, and Cost Accounting Subjects of Meeting

THE economic, as well as the technical, problems of the industry were discussed in the annual convention of the American Drop Forge Association, which took place at the Drake Hotel, Chicago, on June 22, 23 and 24 inclusive. There was a total registration of 325, of which 177 were members and guests of the Drop Forge Association, and the remainder was made up of members of the Drop Forge Supply Association.

The officers of both associations were re-elected, those who serve another year for the Drop Forge Association being: President, Ferdinand Barnickol, Indianapolis Drop Forging Co., Indianapolis; vice-president, J. P. Hopkins, Atlas Drop Forge Co., Lansing, Mich.; treasurer, T. W. Siemon, Union Switch & Signal Co., Swissvale, Pa.; secretary, E. B. Horne, Rochester Foundry & Machine Co., Rochester, Mich. Three new directors were elected, however: C. J. Coughlin, Ladish Drop Forge Co., Cudahy, Wis., to succeed H. G. Stoddard, Wyman-Gordon Co., Worcester, Mass.; J. P. Hopkins, to succeeed E. J. Frost, Frost Gear & Forge Co., Jackson, Mich.; E. B. Sehl, Billings & Spencer, Hartford, Conn., to succeed T. W. Siemon.

The officers of the Drop Forge Supply Association, who continue in office for another year, are: President, Hollinshead N. Taylor, N. & G. Taylor Co., Philadelphia; vice-president, Charles D. Harmon, Jr., National Machinery Co., Tiffin, Ohio; secretary-treasurer, A. L. Wurster, Heppenstall Forge & Knife Co., Pittsburgh. Two new members were added to the executive committee: V. B. Schupp, Sizer Forge Co., Buffalo, N. Y., and Homer A. Heman, Ajax Mfg. Co., Cleveland.

Size and Plans of Drop Forge Industry

The convention was opened by an address by President Barnickol. He stated that the real development of the industry had come within the past 20 years and was coincident with the growth of automobile manufacturing. He believed it safe to estimate the present investment in the drop forge industry at $100,000,000 and the annual output in normal times at $200,000,000. At least 2500 hammers and upsetters are in use normally, but not more than 20 per cent of that capacity is regularly employed at the present time. He stated that new markets must be sought and the cost and quality of product must be adjusted so that drop forgings may more largely replace other metal products in American industry. He stated that the association had a membership up to date of 123 companies, as against 128 last year, or a net loss of 5. A few members were transferred to the supply association, because they belonged more logically to that body, and 13 new members were taken in during the year.

A report of the committee on safety work was read by the chairman, G. A. Kuechenmeister, Dominion Forge & Stamping Co., Walkerville, Ont. Mr. Kuechenmeister stated that the committee had not been appointed until last September and did not function until March. Questionnaires, however, had been sent to all of the members and on the basis of the replies it was concluded that mechanical safeguards for forging equipment are generally indorsed and that it is the urgent desire of members that equipment manufacturers provide guards for all of their machinery. Among the chief causes of accidents which were named were falling boards, falling nuts and bolts, burns, broken cylinder heads, hands crushed between dies, hands caught in rolls, fingers and hands crushed in trimming presses and men caught in line shafting. Among the general recommendations made were the following: General cleanliness of shop, keeping the aisles clear and the windows clean, strict enforcement of safety rules and the discharge of negligent men if necessary. It was also emphasized that workmen should be instructed, educated and examined before being employed for any particular job. It was suggested in the report that better results could be accomplished for the association if it affiliated with the National Safety Council as a drop forge section. A motion was passed, however, which instructed the committee to continue its work for another year, at the conclusion of which time the decision as to affiliation with the safety council may be made.

Steam Versus Board Drop Hammer

R. T. Herdegen, Dominion Forge & Stamping Co., Walkerville, Ont., read a paper which gave the results of an investigation of the relative costs of operating steam and board drop hammers. His results showed that a 1600-lb. board hammer was more economical to operate than a 1500-lb. steam hammer. The conclusions which he reached on the basis of his research were that it is not desirable to install steam drop hammers smaller than 2500 lb., that for small work the board hammer is more satisfactory, while for very large work the steam hammer is the logical unit.

In the discussion, Edward Adams, Cleveland Hardware Co., Cleveland, stated that preference for steam or board hammers was largely geographical in character, the use of the steam hammer being general in the West, whereas east of a line drawn from Buffalo through Pittsburgh, the board hammers were in preponderance. He stated that the industry was just beginning to learn that both types of hammers have their place and are better adapted for certain work than the other type. In other words, the steam hammer will encroach upon the Eastern field, while the board hammer will make inroads in the West. President Barnickol pointed out that steam and board hammers cannot be successfully operated in the same shop, as both the men and management always evince more interest in the steam equipment. If results are to be obtained from the board hammers, they must be located in separate departments with separate foreman and men.

Electric Versus Fuel-Fired Furnaces

The metallic resistor electric furnace is rapidy replacing the fuel-fired furnace for the heat treatment of dies, as well as drop forged parts, because of its simplicity, its dependability, its low upkeep, its improved product, its ability to turn out repetition work free from defects, and its over-all economy, said E. F. Collins, consulting engineer, industrial heating department, General Electric Co., in addressing the association. He pointed out that in the electric furnace temperature could be accurately regulated through automatic control and uniform heating of the steel throughout was assured. At the time operating costs for the electric furnace are no higher and often lower than those of the oil-fired furnace. A large-sized furnace, suited to heating large dies, punches and cutters, at temperature not exceeding 1800 deg. Fahr., and equipped with automatic control, made the following performance as compared with a similar oil-fired furnace on the same work:

Comparative Performance of Heating Furnaces

	Electric	Oil Fired
Dimensions, heating chamber, in.	30x36x22 high	48x24x20 high
Average temperature held, deg. Fahr.	1450	1400
Fuel or power to hold at 1400 deg. Fahr.	8.04 kwhr.	1.65 gal. per hr.
Cost per hr. to hold 1400 deg. Fahr.	10c. (at 1.25c.)	23.1c. (at 14c.)
Amount of steel heated per hr., lb.	84	84
Fuel or power for heating steel	13.35 kwhr.	1.9 gal. per hr.
Cost fuel or power per hr., c.	16.7	26.6
Cost per lb. heating steel, c.	0.199	0.317

Mr. Collins presented data showing the excellent record of a vertical design of furnace of 2700 kw. capacity with the ability to heat forgings weighing

320,000 lb. per charge. An actual charge consisting of gun tubes and gun jackets, weighing 65,900 lb., used 5842 kwhr., at an actual cost of $3.28 per ton for hardening and drawing.

In a written discussion of Mr. Collins' paper, Harold F. Wood, Ingalls-Shepard Division of the Wyman-Gordon Co., Harvey, Ill., took issue with the statement that a fuel-fired furnace could not be as accurately regulated as an electric furnace. He stated that his company had several oil-fired furnaces in operation and controlled them to a variation of plus or minus 10 deg. while coming up to temperature and a total variation of plus or minus 5 deg. Fahr. during the soaking period. This, he said, is about the limit of uniformity that can be obtained in commercial practice by either an electric or oil-fired furnace.

In comparing the two types of furnaces, he stated that the following costs were the same on either installation: Land and buildings, indirect labor, supplies, general factory burden, miscellaneous charges and direct labor. In considering the matter of equipment, he said that interest and taxes on the electric furnace are approximately twice those of the oil installation because the first cost is in that proportion. Depreciation and repairs on a well-built oil furnace will be approximately 5 per cent higher per annum than on a well-built electric furnace. Owing to the higher first cost of the electric furnace, however, the actual dollars and cents loss from depreciation and repairs over a period of a year amounts to more in the case of an electric furnace in spite of the lower percentage rate on the same. He concluded, therefore, that in the selection of heat treating furnaces for treating drop forgings, the factor which determines the most economical installation is cost per 100,000 B.t.u. effective. He presented the following table, giving the corresponding cost per kwhr. and per gal. of oil, based on the conclusion that 318 kwhr. is equivalent to 30 gal. of oil.

Cost per Kw.-hr. in Cents	Cost per Gal. Oil in Cents	Cost per Kw.-hr. in Cents	Cost per Gal. Oil in Cents
0.20	2.12	1.20	12.72
.30	3.18	1.30	13.78
.40	4.24	1.40	14.84
.50	5.30	1.50	15.90
.60	6.36	1.60	16.96
.70	7.42	1.70	18.02
.80	8.48	1.80	19.08
.90	9.54	1.90	20.14
1.00	10.60	2.00	21.20
1.10	11.66		

This table, he said, indicates that it is more economical to install oil than electric furnaces. He asserted, however, that the drop forge plant offers great possibilities for the generation of electricity from waste exhaust steam by means of low pressure steam turbine generators. This will make it possible to generate electricity at a total cost, including all overhead on generator plant and transformer equipment, at a price not to exceed 0.40c. per kwhr. This would show a very large saving over the very best price that can be secured on oil now or in the future.

Dr. Samuel Trood, Tate-Jones & Co., Inc., Pittsburgh, discussed "Furnace Conditions for the Proper Heat Treatment of Die Blocks," illustrating his remarks with stereopticon slides. Dr. Trood seconded Mr. Wood's contention that temperature control could be as accurate on a fuel-fired furnace as on an electric furnace. He outlined the following principles as fundamental in the design of a fuel-fired furnace for heat treating: 1. Proper proportioning of the fuel and air. 2. Proper mixing of fuel and air. 3. Ascertainment of temperature necessary for simultaneous ignition of mixture. 4. Ascertainment of relative time element necessary to complete combustion. 5. Ascertainment of the proper velocity of products of combustion. 6. Proper design of space in which combustion is confined. 7. Provision for recirculation of gases of combustion within the combustion chamber.

John Bruner, Illinois Steel Co., Chicago, delivered an address on the manufacture of steel, illustrated by motion pictures.

Necessity for Proper Cost Accounting

In a paper on "Necessity for Proper Cost Accounting," J. B. Sehl, Billings & Spencer Co., Hartford, Conn., summarized the primary purposes of cost accounting, as follows: 1. To ascertain actual costs. 2. To forecast with reasonable accuracy in order to fix future selling prices. 3. To reduce costs. 4. To increase efficiency. Manufacturing costs, he said, were made up of three elements: material, labor and manufacturing overhead, or burden, as it is often termed. The general factory burden is made up of three general classes: 1. Expenditures that do not vary with an increase or decrease of production, known as "fixed charges." 2. Expenditures that vary to some extent with an increase or decrease of production, known as "semi-fixed items." 3. Expenditures the volume of which is in direct relation to the volume of production, and which are usually termed "variable charges." After the proper determination and classification of the general burden charges, the next step and the most important, is properly to apportion and distribute it over the producing departments or operations. This having been done, the next procedure is to "cost" the articles manufactured with an amount truly representative of their share of the burden incident to their manufacture.

The best method, in the estimation of Mr. Sehl, is the "machine rate" or "production center" method. To ascertain the machine rate, it is necessary to classify machines or processes into groups of similar operation, to determine the operating costs of groups for a given period, and to determine the operating hours of the groups of the same period. Operating costs, divided by the operating hours, give the actual cost per hour. The machine rate system is best worked out on the basis of predetermined, or standard, rates. A detail statement is provided for each production center or unit, showing the number of machines in the group, the possible hours and estimated hours of activity, and any other facts which will make the statement convenient for reference. If the statement is in columnar form, in the first column is entered the estimated costs for the period and in the second column the actual costs for the same period. In a third column can be entered the variance between the estimated and actual expenditures.

Some cost finding arrangements, said Mr. Sehl, have been unsuccessful because they adhere too closely to the prevailing idea among accountants that the principal use of cost finding is to fix selling prices. Most important of all its uses as an aid to executive control is the opportunity for comparison of costs, order by order, or of actual processes with standard process, and the absence of this has caused many cost systems to break down in times like the present and just when the information is needed the most.

Present day conditions, he said, are marked by more than a usual effort to discount the future, and it is sound business to fix one's prices on the basis of what one believes will be the prevailing cost under near future conditions, and this can be done by analyzing and forecasting manufacturing and other costs and also by recognizing the fact that present-day inventories are worth no more than their replacement value.

Predicts Cycle of Falling Prices

That an extended period of falling prices lies ahead was the conclusion drawn in an address made by Col. L. P. Ayres, vice-president Cleveland Trust Co., Cleveland. Colonel Ayres was formerly statistician for the Russell Sage Foundation, and was in charge of statistics for the United States Government at the Peace Conference. He exhibited price charts for the past six years, showing variations in both retail and wholesale prices. Assuming that $1,000 would cover the living expenses of a normal family in 1915, $1,650 are required to maintain the same standard of living to-day, whereas the peak was reached in July, 1920, when $2,050 had the purchasing power of $1,000 in 1915. The index numbers for wholesale prices showed a rise from 100 in 1915 to 272 in May, 1920. Since that time wholesale prices have dropped more rapidly than ever before in our economic history, and last month the index number was 152. Retail prices, he said, never fluctuate so violently as wholesale prices and always lag behind the latter. He exhibited a chart to demonstrate this point. He stated that wholesale prices always changed first, retail prices come next, wages follow retail prices, salaries follow wages, and rents

change last. He showed graphs indicating the changes in wholesale prices in Italy, France, England and United States. Similar fluctuations occurred in all of these countries between 1915 and 1921, although the fluctuations were sharper in some countries than in others, the changes being most pronounced in Italy, next in France, next in England and the least in the United States. Italy's maximum increase in wholesale prices was 600 per cent, as compared with 172 per cent in this country.

Colonel Ayres exhibited charts showing changes in prices in this country from 1810 to 1920. The index number was high at the beginning of this period because of the Napoleonic war, and in 1812 when the United States became involved in this war, it rose to 247. At the conclusion of the war it dropped with a suddenness never equaled until the great war, then declined with a few minor interruptions until Andrew Jackson inflated our currency. This inflation resulted in a panic with a further sharp drop in the index until the Mexican war caused another upturn. This was followed by another decline until discoveries of gold in California and Australia brought on another rise. This was followed by a decline and then a very sharp advance during the Civil war, which, with minor changes, was followed by a general decline in prices until in the middle 90's the index number reached the lowest level in the century. This was followed by a general advance until the world war, when prices rose to the highest level in the entire period. Colonel Ayres pointed out that prices had passed through three big cycles in the period of 110 years, which might roughly be divided into periods of 30 years of falling prices and 30 years of rising prices, on each side of each peak.

He gave as his opinion that we are now entering a long period of falling prices, ten years or so, with some minor interruptions. He pointed out that the purchasing power of the world has been reduced through the loss of so many men killed in the war, whereas the production of raw material has been increased beyond the consumptive capacity of the world. He stated that the world is economically out of balance. The output of raw materials which was stimulated by the war is now in excess of the ability of industry to utilize it. European countries, he said, will try to rehabilitate their currency, which means that they must secure gold and they must get it here. This means that they will sell manufactured products in this country in exchange for gold, which will force our own prices down. The business men in this country are facing a new situation. They must learn how to make profits in a period of declining prices. That this can be done is evidenced by the fact that most of our railroads were built in the period of declining prices following the Civil war, and many of our large industries got their start during that period.

Colonel Ayres also exhibited a chart showing changes in wages for artisans and common labor, from 1820 to the present time. Unlike the price chart, the wage chart showed a rather steady increase during the 100 years. In 1820 an artisan received an average wage of $7 a week, in 1860 $10 a week, 1865 $15 a week, 1867 $17 a week, 1879 $14 a week, 1880 to 1900 about $17 a week, and from 1900 to 1920 there has been a sharp increase. He asserted that the reason that wages held their own and increased during a period of falling prices lay in greater production per man per day. Steam power was introduced into industry in that period. Automatic machinery came into use. Electricity was applied to industry. Large industrial combinations came into being—all tending to increase the output per man per day. As we pass through the coming cycle of falling prices, wages will have to go down in proportion to prices unless labor changes its attitude toward production. In other words, labor cannot expect to maintain its present scale of wages unless it cheapens the cost of production by still further increasing the output per man per day.

Colonel Ayres stated that we have been actually passing through a silent panic, a panic which has been devoid of the disastrous characteristics of past panics only because of the existence of the Federal Reserve system. He believes that the time is not far distant when the wheels of industry will again be turning at normal speed. This country, he said, is actually consuming more than it is producing, and when it has worked through the stocks now on hand it will again resume buying. This, he said, has already been demonstrated in two industries which have been least affected by the depression. Salt, he said, is one commodity which is used day in and day out in about the same quantity, whether times are good or bad. This industry continued to run full tilt until October, 1920, when it came to almost a complete halt. In April of this year, however, full operation was resumed, indicating that the stocks in dealers' hands had been completely absorbed by the consuming public. In other words, the grocer, seeing signs of depression last fall, decided not to make any further purchases of salt until his stock had been disposed of, thinking that lower prices would develop in the meantime. Manufacturers of paper flour sacks had a similar experience, running full until October, and then being completely idle until May, when full production was resumed.

Future of the Tractor Business

James M. Irvine, Curtis Publishing Co., Philadelphia, delivered an address on "The Future of the Tractor Business." Mr. Irvine stated that in 1912, when the present type of farm tractor was first manufactured, there was a production of 11,500. This was increased to about 200,000 in 1920, while the output for this year will show a marked decline. The reason for the falling off of sales, he said, is the fact that when farmers were getting high prices for their products they did not worry so much about costs. During the war they were commanded to produce to the limit. As a matter of fact, he said, a large proportion of tractors sold were imperfect and unsatisfactory. The time has arrived when the manufacturer must turn out a machine which will prove so serviceable that the farmer will be forced to recognize its merits.

He showed figures compiled several years ago to demonstrate the field for power on farms. Estimating each horse and mule as equivalent to 3/5 hp., and including stationary gas engines, wind mills, steam and gas tractors, there were 27,000,000 hp. in use on the farm, as against 22,500,000 hp. in manufacturing industry. It remains for the manufacturer, therefore, to convince the farmer that the tractor should replace the animal as a power unit on the farm.

Mr. Irvine pointed out that the 1910 and 1920 censuses disclosed an increase in the size of farms. This will also tend to stimulate the use of tractors. He said that although a considerable number of farmers had failed during the recent industrial depression, the number had been grossly overestimated and that sellers of tractors did not need to fear that the necessary buying power was not there. He expressed the belief that both tractors and agricultural implements would have to be made better than in the past, because the time element on the farm makes breakdowns of machinery very serious. Production of better machines, he believed, would mean the use of forgings where castings suffice now.

Predicts Big Future for Automobiles

C. E. Adams, Cleveland Hardware Co., Cleveland, asserted that the point of saturation in the automobile industry will not come until every man, woman and child, now forced to ride in crowded street cars, has or owns an automobile. It was first said that the automobiles were a passing fad and that the farmer couldn't afford to buy them. Yet the production of buggies has dropped from 2,000,000 a year to 100,000 a year, indicating a wide use of cars by farmers. Mr. Adams recalled the seasonal character of the carriage business and predicted that the automobile business would also soon find itself on a seasonal basis. Formerly carriage buyers used to make their contracts for the following year in August and manufacturers likewise would make contracts with parts makers for a like period. The carriages would then be shipped to the jobbers, who in turn would ship them to the dealers for sale to the consumers when the roads dried up in the spring. He admitted that the automobile is more largely used in the city than the carriage was, but was of the opinion, nevertheless, that the influence of the farm demand

would be dominant and that automobile plants would be busy for about eight months a year with a quiet period during July, August, September and perhaps October.

He is of the belief, therefore, that it will prove uneconomical for automobile manufacturers to make all of their own parts. To install forging equipment, for instance, and use it only for six or eight months a year would prove an economic loss. The automobile of the future, in his estimation, will be an assembled product. The engines will be built by engine men, the chassis by chassis makers, and all the various parts by parts manufacturers. Mr. Adams recalled the history of the carriage business in which manufacturers who purchased their parts and assembled them crowded out the older makers who produced the vehicles in toto.

Entertainment Features

During the course of the convention members of the association made visits to the Ajax Forge Co., Chicago; the Interstate Iron & Steel Co., Chicago; A. Finkl & Sons Co., Chicago; the Crane Co., Chicago, and the Studebaker Co., South Bend, Ind. On Thursday the delegates attended a luncheon at the Drake Hotel and a banquet at the Marigold Gardens, as the guests of the Drop Forge Supply Association.

The Steel Industry and the Railroad Settlements

Buying by the Carriers Hinges on Prompt Payment of Government's Indebtedness—Proposal to Fund the Offsetting Claims Against the Roads

WASHINGTON, June 28.—The steel industry has no small stake in the efforts the administration is making to solve the railroad problem. After an extended conference with Western bankers last Thursday night, President Harding called in on Friday Secretaries Mellon and Hoover, Chairman Edgar E. Clark of the Interstate Commerce Commission and James C. Davis, Director General of Railroads. It is the opinion of the administration as well as of the business men with whom conferences have been held that there will be no satisfactory resumption of industrial activity until the Government pays its indebtedness to the railroads. The settlement of the claims growing out of the 26 months of Government control and the Government guaranty of the six months following will be an important factor in relieving the present depression in iron and steel, lumber, and other basic industries.

Claims May Reach $1,250,000,000

The railroads are filing claims against the Government on a basis which indicates a total of about $800,000,000 for under-maintenance in addition to the balance of rental for the 26-month period. According to Director General Davis the total of all claims, at the rate they have been filed, will be $1,250,000 000. Total claims filed to May 1 amounted to $633,000,000, of which $42,000,000 had been paid and it is estimated that since then $20,000,000 additional has been paid to apply on charges coming under the period of federal control. In the past six months approximately $400,000,000 has been paid from the Treasury. The Government has claims for capital expenditures and other items which in part will offset those of the railroads. If a settlement of these accounts could be expedited the railroads would be given large sums which would be available to pay some outstanding bills, including those owed to iron and steel manufacturers, car builders, railroad supply companies, foundrymen and other interests which furnish supplies in large quantities to the carriers. Likewise the railroads would be enabled to resume maintenance work, putting tracks and cars in condition, and this necessarily would mean the purchase of considerable steel.

The difference between the Railroad Administration and the railroads is due to inability to agree as to whether the dollar or a unit of physical work shall be the basis for calculating under- or over-maintenance. The Railroad Administration takes the position that if it spent as many dollars as were spent during the test period plus an amount equal to the increase in wages and in prices of materials, its obligation would be fulfilled. The railroads contend that this does not cover the inefficiency of labor and that the obligation of the Government is to pay for the actual cost of an equivalent amount of work, or, as they put it, "an equivalent of physical reparation." A difference of $300,000,000 exists between the theory of the railroads and that of the Director General as to the amount due for the six months following the period of control. The Interstate Commerce Commission is understood to be divided in opinion on this question. The Bureau of Finance of the commission has issued a tentative opinion which supports the contention of the railroads.

Railroads Would Pay Government in Bonds

Another feature of the situation concerns the $700,000,000 or $800,000,000 which the Government expended on the railroads for permanent capital improvements. This sum has been charged against the railroads with interest and the Railroad Administration in general has been deducting these amounts from those it still owes the carriers on current compensation in making the settlement. The railroads point out that if they had been in charge of their own properties these capital expenditures would have been met by the issuance of long-term securities and not paid for out of current income. As they are unable to market securities for these expenditures now on reasonable terms, they ask the Government to take their bonds running for a term of years and pay them promptly the full sums due from the Government. To fund the entire amount would require the Railroad Administration to ask Congress for an additional appropriation of no less than $700,000,000 or $800,000,000, as compared with an estimate of $200,000,000 presented to the House Committee on Appropriations by the administration.

The opinion prevails in Washington that the claims of many of the railroads are somewhat excessive and support of this idea is found in the fact that a large number of small railroads and half a dozen large railroads already have settled with the Railroad Administration for approximately 40 to 50 per cent—and in some instances much less—of the amount of their claims.

Conditions of Prompt Settlement

Apparently the administration, bankers and others interested are trying to see if the railroads cannot be induced to scale down their claims, particularly those for maintenance, in return for a quick settlement of the undisputed items. This money evidently would be used by the railroads to pay outstanding bills for materials, supplies and traffic balances to each other, and also in order to resume maintenance work so as to put equipment and tracks in condition to handle the heavy business which some Government and railroad people think is not far off.

Indicating the condition of the railroads is the fact that on June 1 about 16 per cent, or approximately 350,000, of the freight cars were reported as in bad order, as against the 8 or 9 per cent which the railroads complained of when the Railroad Administration returned the lines to private management. While the railroads recently have been showing reductions in their expenses, a large part of the decrease arises from deferred maintenance. Statistics just made public by the Interstate Commerce Commission show that in March the railroads had 416,000 fewer employees than in March, 1920, and nearly 600,000 fewer than they had during the period of heaviest traffic last fall.

The Way Out in Industrial Relations*

How Shall the Management, Labor and the Public Secure Justice?—What Underlies the Movement for a Conference Footing in Individual Companies?

BY JOHN CALDER†

THERE are three characteristics of men which hinder progress in business and social matters:

1. A great many men depend upon luck for success; not necessarily the luck of the ouija board, but they have a deep belief that the cards will be good the next time.
2. Many men never think except to justify themselves; they are always seeking for alibis; trying to justify to themselves something they have done, or are about to do, rather than searching for the truth.
3. Many men to-day are unable to think their problems through.

The undeveloped man is unable usually to ponder things to a competent finish. As a rule, it marks him all over. As a chess player he fails to consider all the possible replies to his attack, and to consider any one of them more than a few moves ahead. As a merchant, he buys goods that attract him, without thinking whether his customers will want them or ought to want them. As a business man, he hires a beginner at $12 if she will take it, at $15 if she asks for $15, at $20 if she insists on $20, promotes nobody until he is forced to do it, and then is surprised that there is so bad a spirit in the plant and office and among the salesmen. As a farmer, he works 10 or 12 hours a day for a dozen cows, without ever thinking whether the cows are supporting him or he is supporting the cows. As a big business director, he votes for bonuses, installs safety devices, hires social workers, and provides amusements to overcome unrest, when the real trouble is the petty tyranny and ignorance of some of his managers and superintendents, and his failure to sell his business and its worth-whileness to his employees.

The Workman's "Due"

Not long ago you could hardly ride two hours on a trolley car or train alongside workmen without hearing one of them say, in the course of otherwise sensible remarks, "Why shouldn't every workingman receive his $50 a week or his $100 a week?" Why shouldn't he? If you reply, "For the same reason that he can't get 50 eggs a week or 50 quarts of milk a week," he will see nothing in that. If you then ask him, "How much is $50 or $100 multiplied by 400,000,000?" he will think you are mildly insane. And then if you should ask him, "How can you expect to divide more than all there is?" he will tell the fellow next him, "We are traveling with a nut!" It is easy for *one* workman to see how *one* workman, to wit, his important self, can get $100 a week. He knows where *he* can get it by due process of squeeze without any social or financial miracle; but he fails to carry on the thought and ask where forty billion dollars a week is to come from, if all folks everywhere are treated as he insists on being treated.

* * * * * What are we going to do as individuals about this inefficiency in thinking? This fellow who relies on luck to help him out, who justifies his errors rather than correct them, who thinks nothing through to a finish, is in our plants and offices to-day; he is sometimes actually in charge of policies, people and things; so what are we going to do about it? How can men be treated right and led to efficient production and self-development by such lame, self-deceiving guides? How can workmen of the same stamp be enlightened?

Only in two ways: First, replace the sham thinking by the real thing wherever possible, by well-considered training and education of the individual. Secondly, carry into the plant collectively such simple, convincing knowledge of the real business game and of the worth-whileness of thinking straight and living straight, as will restore some joy to the job. * * * *

A Basis for Justice

The "old school" of capitalists practised unrestrained power for many years, untrammeled by the imposition and application of regulatory laws. In the heyday of initiative and enterprise neither industrial law nor industrial labor thwarted their will.

They were accustomed to exercising unquestioned authority. Their word was law. Their employees did their bidding without effective protest and we must admit society as a whole profited greatly from the administrative genius of these pioneers, even if labor was denied for a time the right to make its own mistakes.

To-day we live in a different age. Capital and capitalists became so arrogant that the public rose in rebellion and laws designed to curb their power and their tyranny were placed on the statute books. That such laws were needed only a few reactionaries would question to-day. The newer generation realizes that the times have changed, that capital can no longer dictate, that democracy and not the dollar is in the saddle, that industry must consider human souls as well as profits. The fact is that labor and capital alike reserve the right to make their own mistakes and this condition in our day is restrained only by considerations of the public interest.

Public Opinion and Unions

The art of combination, originated by capital, was duly taken up by labor. Giant strides were made. In nine cases out of ten public opinion used to be on the side of workers in their disputes with corporations. During the war, however, labor, aided by an indulgent and careless administration, gained victories faster than the most ardent union leaders had ever prophesied. In many ways, in fact, labor attained dictatorial power. In some cases this dictatorial power was exercised in so arrogant a way that the public became incensed. The capital versus labor struggle is now being waged as bitterly as at any time in our history. The public is acting as umpire. The final verdict has not yet been delivered.

Bluntly, both employers and unions are now on trial before the bar of public opinion. The contentions of one class of employers, although not the contentions of many belonging to the newer school of industrial and financial leaders, are widely circulated and the more radical, not to say revolutionary, labor leaders are constantly laying before the public the contentions of labor.

Union Leaders' Mistake in Fostering Hostility

We find many employers who are ready to treat with their employees as members of national labor unions or as members of company councils and like organizations or both, whichever the workers choose to belong to, and that they are anxious to adopt and follow a conciliatory course. We find, too, a growing disposition among rank and file workers to embrace plans calculated to draw them closer to their employers by means of shop committees, councils and the like.

Moreover, investigations lead us to believe that a vast number of union men feel that many of their professional leaders are going too far and too fast in opposing, root and branch, every movement calculated to bring any one employer and his employees closer together.

*From an address before the annual convention of the Iowa Manufacturers' Association, Sioux City, Iowa, May 26, 1921.

†Manager of industrial relations, Swift & Co., Chicago. Mr. Calder's long experience in industrial management included connections with the Remington Typewriter Co., Remington Arms U. M. C., International Motor Co. and Aeromarine Plane & Motor Co.

As we see it, union leaders and enlightened employers are now waging a contest to gain the allegiance and loyalty of American workmen. The majority of the workmen in the end will follow those who lead them most wisely, those whose leadership will bring about the best working conditions, the best opportunities for advancement and the best wages consistent with the best conditions for the country as a whole.

The decision of the workmen will be influenced, if not governed, by the verdict of public opinion as to whether labor leaders or employers following the sounder course, the course calculated to lead to prosperity for all; the course, in a word, which will "make goods plentiful and men dear" in the best sense of the term.

What the Workman Wants

Meantime, while we know specifically what some people do not wish the workman to have and what other people insist that he should desire, let us closely scrutinize what the workman really wants. Let us put it very briefly and ask and answer out of our experience with tens of thousands of workmen for nearly 40 years, these four questions:

1. What is it?
2. What causes it?
3. What of it?
4. What are we going to do about it?

1. *What Is It?*—Just five things:
   (a) A steady job.
   (b) Adequate real wages.
   (c) A good foreman.
   (d) A voice in settling his own conditions.
   (e) A chance to rise on his merits.

What Is Behind the Want

2. *What Causes It?*—The nightmare of unemployment. The standard of living. The unintelligent and unwise handling of workmen individually and in small groups by supervisors who lack energizing and enlightenment and sympathy and need education in the economics and psychology of co-operating with workers to "make goods plentiful and men dear."

The worker, like his employer and the nation, *reserves the right to make his own mistakes*, and the practical denial of this right in many cases has caused him to become vocal about it.

The worker wants to know a lot of things. He wants to know how things happen; why things happen, and how he can reconcile these happenings with his keenly-felt limitations. He wants to have a fighting chance to *break through somewhere*, some day, if he can, and that little bit of blue sky must be in the industrial scene.

Some Symptoms

3. *What of it?*—Unrest! Industrial wars and rumors of wars. A state of mind which is fertile soil for the man, often not a workman, who wishes to capitalize the worker's feelings for quite different and subversive purposes.

Men are moved much more by their feelings than by their thoughts. When intelligence, emotions and disposition—the three motive powers of human beings—are appealed to in people lacking necessary information, the fact that your appeal is based on truth has very little to do with the result, if those to whom you appeal are, whether rightly or wrongly, in an exasperated state of mind. What of it? Low production; low morale; little co-operation; readiness to change our social and economic system for others which give no guarantee of betterment.

Lines of Action

4. *What Are We Going to Do About It?*—Educate! Educate whom? The employer, the superintendents and the foremen, the employees and the public in the art of co-operating harmoniously in "getting a living."

Education how? Suitable literature; talks, personal contacts; open forums of supervisors and employees where a chance to talk back is afforded and where there is an opportunity to air both ignorance and knowledge, truth and untruth.

Employees' representation plans are the natural result of such action. They are the permanent formulated method of discussing the business affairs that mutually concern the management and the employees in any plant. This does not ignore the fact that labor has a mutuality and solidarity transcending the plant as a unit, but it takes adequate care of the relations that belong in the plant and must be settled satisfactorily there, and by so doing it greatly reduces the chances of external friction and misunderstanding which are always present when employees and sometimes supervisors are left "up in the air" about their company's policies, intentions and problems, and the company has no adequate idea of its employees' problems.

If you ask one of the employees, or even supervisors, of a secretive, aloof ownership and management what he knows and thinks about his company, you will be astonished at the mixture of untruth and prejudice which exists, simply because they would not "tell their people."

Employees' representation is simply "telling them" in a representative way which is calculated to reach down to all of the people; and Swift & Co., who have had such representation in three of their plants for over two years have this week extended it to fourteen additional plants, because they thoroughly believe that their great business can be justified to their employees and harmonize with the latters' interests. To do this is not philanthropy, is not paternalism; it is just "good business."

Committee on National Resources Formed

WASHINGTON, June 26.—Following a meeting of committees from the National Academy of Sciences, the American Association for the Advancement of Science and the National Research Council, an executive committee on national resources has been organized. This committee will appoint a paid executive and the necessary clerical force, with an office in this city. The purpose of the committee is the promotion of scientifically directed effort and education for the most efficient and advantageous use of the natural resources of the United States. It is pointed out that there has been a much larger consumption and loss of natural resources than has been necessary, and it is the purpose of the scientific association and organizations to disseminate information and instructions as to the real condition of natural resources of the country; to warn the nation where danger of exhaustion lies and, in the light of the best scientific and practical knowledge now possessed and through new researches directed to this end, teach the ways in which resources may best be maintained.

The following took part in the organization: John C. Merriam, president, the Carnegie Institution of Washington; John M. Clarke, director, New York State Museum; J. McKeen Cattell, editor of *Science;* Vernon Kellogg, secretary, National Research Council; C. E. McClung, director, zoological laboratory, University of Pennsylvania; Henry S. Graves, former chief United States Forest Service; Isaiah Bowman, director, American Geographical Society; Harrington Moore, president, American Ecological Society; V. E. Shelford, professor of zoology, University of Illinois.

Mr. Merriam is chairman; Mr. Clarke, vice-chairman; Albert L. Barrows, secretary, and Willard G. Van Name, assistant secretary.

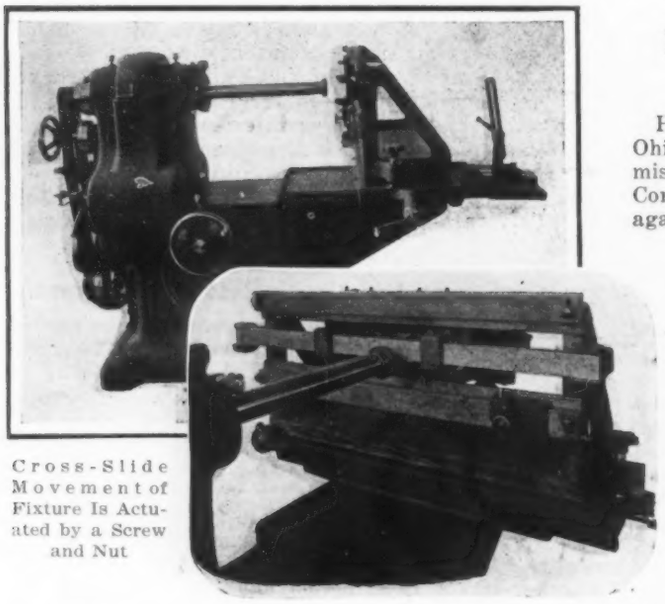
The two following publications of the Bureau of Standards, Washington, have just been released for general distribution: Circular No. 100, entitled "Nickel," contains 106 pages in which are included an account of the metallurgy, physial properties, effect of impurities, and the characteristics of the commercial alloys of nickel; Tehnologic Paper No. 188, entitled "White Metal Bearing Alloys at Elevated Temperatures," describes the results of an investigation on bearing metal alloys of particular interest in the automotive industry, the temperatures considered in this investigation running up to 100 deg. C.

The Ohio Founders' Association will hold a regular meeting in Cleveland, July 12.

Cylinder Grinding Machine

A cylinder grinding machine known as the No. 5, for regrinding automobile cylinders, has been recently brought out by the Landis Tool Co., Waynsboro, Pa., and in range of work capacity includes all makes and types of automobile cylinders cast en bloc as well as a miscellaneous variety of irregular castings.

The grinding wheel spindle center of rotation is 10 in. above the top of the work carriage so that large castings may be handled without special fixtures. The grinding wheel spindle regularly furnished will grind 15 in. deep and two wheels 2½ and 3½ in. in diameter are included as regular equipment. Eccentric adjustment of the spindle range from 1/16 to 1 1/16 in. which permits grinding holes as large as 5⅝ in. with standard 3½ in. diameter wheels. Two spindle driving pulleys are furnished to give correct peripheral speed of approximately 6400 ft. per min. with 3½ and 4½ in.



Cross-Slide Movement of Fixture Is Actuated by a Screw and Nut

diameter grinding wheels. Extra wheel spindles and sleeves for grinding 20 and 22 in. deep or for diameters larger than 6 in. can be furnished if desired. These sleeves are interchangeable on the regular machine.

The work carrying fixture is an open angle plate design with two adjustable work clamping bars. The work is securely clamped to the bars by two clamps of ample capacity. A distinctive feature of this fixture is the arrangement for quickly and accurately aligning the work in vertical position to the center of spindle rotation. This centering bar fits into two slots milled in the frame of the work carrying fixture and carries two adjustable centering brackets. Before clamping the work on to the machine these centering brackets are inserted into the hole to be ground to ascertain the exact size. They are set to this dimension and the bar is inserted in its position on the work carrying fixture. The work is then lifted to the machine and over the brackets of the aligning bar, where it is securely clamped to the work carrying fixture, after which the aligning bar is removed. If work is not absolutely aligned, minor adjustment can be made by a screw in front of the fixture which permits it to be raised or lowered as required.

Cross-slide movement of the work carrying fixture is actuated by a screw and nut. A dial on the screw, graduated in thousandths of an inch insures accurate movement when changing from one hole to another. The work carriage has a cross movement of 27½ in. The work carrying fixture is mounted on a traveling carriage which is operated on a flat and a dovetail guide. Lubrication of these guides is assured by rollers running in pockets filled with oil. Traverse movement of the work carriage is automatic and reversing action is obtained by two self-locking adjustable dogs. These dogs are accurate in their functioning which permits grinding close to the shoulders without injury to same. Speed of traverse is constant at 10 in. per min., and is independent of all other mechanisms. Maximum movement is 31½ in. long.

The outside eccentric spindle which carries the wheel spindle eccentric sleeve runs in two wide capped bearings, and liners afford correct running fit. The lower half of bearing is cast as a part of the head which makes it rigid and eliminates vibration at this point. The eccentric adjustment or cutting feed is obtained by the relative position of the two eccentric sleeves, one within the other. Feed is obtained by a sensitive mechanism mounted on end of the outer sleeve. Provision is also made for application of crank for rapidly changing from one sized hole to another.

The machine is arranged for either direct motor drive or for lineshaft drive through a small overhead counter. If motor drive is used a 3 h.p. motor operating at 1150 r.p.m. furnishes ample power. When driving from a counter a 3½ in. belt is used. Floor space occupied is 88 x 88 in. and net weight, about 2900 lb.

Hear Complaint Against Spotting Charges

Hearings were conducted last week at Youngstown, Ohio, by an examiner of the Interstate Commerce Commission on a complaint filed by the United States Steel Corporation and its subsidiary, the Carnegie Steel Co., against "spotting" charges for ore cars. The complainants cite that the railroads should place or "spot" ore cars free of charge, and that the charges now made for placing such cars at the plants should be included in the road haul rate. Under an order from the Interstate Commerce Commission, the carriers established commodity rates covering the haul up to the plant gates. Additional charges are made under the order when the cars are shifted to sidings within the mill yards. The manufacturers contend that it is the duty of the roads to place cars loaded with coal and ore just as they place cars loaded with other commodities, without charge.

The Carnegie company claimed that the railroads perform this service free of charge for the Brier Hill Steel Co. under conditions not more burdensome than at the Ohio Works of the Carnegie company, where a charge is levied for such service. The carriers, on the other hand, set forth that conditions at the Ohio Works were such that extra work was involved in comparison with the same service performed for the Brier Hill company.

Traffic officers of the more important producers in the Valleys heard the testimony, though none of the independents joined in the complaint. The roads made parties to the action, filed at Washington, are the Erie, Pittsburgh & Lake Erie, New York Central, Lake Erie & Eastern, Pennsylvania and Baltimore & Ohio. Under existing arrangements, switching is done at the Carnegie plants in Youngstown largely by the New York Central engines, the individual roads subsequently paying their share of the expense and collecting from the consignee the spotting charge in addition to the road haul charges.

Opinions on Building Prospects

The Detroit Steel Products Co., Detroit, has summarized the replies sent out by it to 200 nationally known architects, engineers and builders, asking their opinion as to whether now is the time to build, and what are the causes of depression in the construction industry. Among important causes of delayed building industry are listed: Labor disputes, material prices, labor costs, credits, unstabilized conditions, lack of confidence and freight rates. Of those replying, 73 look for a gradual return of building activity, 26 predict an increase of building next year, 25 forecast larger building activity in the fall of 1921, and the remainder designate earlier periods for the improvement.

Indianapolis manufacturers will hold a made-in-Indianapolis exposition the week beginning Oct. 10. Charles F. Wallin will have charge. It will be supported by the Indianapolis Chamber of Commerce.

TRAINED ECONOMISTS

Their Need in Foreign Field Emphasized by President James A. Farrell

WASHINGTON, June 28.—Addressing the first graduating class of the Georgetown University Foreign Service School recently, President James A. Farrell of the United States Steel Corporation, declared that there can be no question about the economic rebirth of the civilized world, for it is already in progress even in places where industrial distress seems almost acute and social disorganization most profound.

"We may not be able to tell the precise extent nor the direction of the forces that are about to change the face of the world, but we may face the future with confidence by the exercise of our intelligent forethought and by being ready to adjust ourselves to the new course of economic development."

Mr. Farrell continued:

"We must devote the same sustained and intelligent effort to international commerce as that which has produced such wonderful results in our domestic trade. The development of our industrial productive capacity during the war, coupled with the changes in our national financial status, might, if unintelligently handled, be the forerunner of distress. It is here that trained leadership will best be felt.

"The interests of the United States abroad have already been more important than was realized by our people at home, but in recent years the realization of this has become more general and the importance of establishing a personnel of trained economists and observers has been brought home not only to those who engaged in trade and to those in the consular and diplomatic service, but to the great mass of the American people as well.

"The admirable work of the Georgetown foreign service students in Venezuela has received international recognition, and is a fine beginning that may well serve as a model for emulation."

New Japanese Process for Extracting Aluminum

WASHINGTON, June 28.—Investigations carried out by the experiment station of the Japanese Government, according to a report received by the Bureau of Foreign and Domestic Commerce, have developed an important discovery consisting of a new method of extracting aluminum from a certain mineral. It is stated that the process has a bearing on the development of Japanese industry and the formulation of an established air policy for the Government. A great refinery plant driven by electric power, it is reported, will be established in Yoyogi. A project is under contemplation to organize a semi-governmental company for the manufacture of aluminum by the new process.

German Trade in Norway

WASHINGTON, June 28.—That Germany is making further strides in invading and controlling markets of the world is indicated by a report from Consul General Snyder, Christiania, who quotes an American maker of nuts and bolts in investigating the Norwegian market, stating that almost complete control has been secured in recent weeks by German houses. It is said that German firms are now quoting lower prices and filling orders in less time than Norwegian factories.

Yard Labor Rate Reduced

Effective July 1 the hourly rate for yard labor at the plants of the American Rolling Mill Co., Middletown and Zanesville, Ohio, will be 30c. The rate previously in effect was 38c. The base rate in effect in 1916 was 20c. an hour, and it is the purpose of the company to readjust all rates of men paid by the hour to 50 per cent above the corresponding rate based on the 1916 base labor scale. No extra time is allowed for overtime. Salaried workers will be given a 10 per cent reduction at the same time.

Census of Blast Furnaces

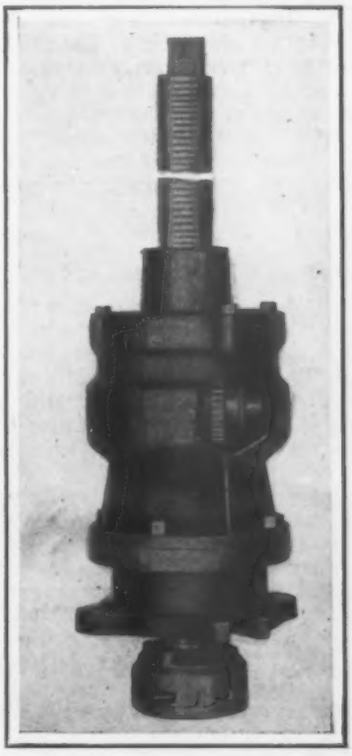
WASHINGTON, June 25.—Preliminary census figures for 1919, based upon the returns from 195 blast furnace establishments, show products valued at $794,466,600. In addition, pig iron to the value of $6,595,800 was produced by 5 establishments included under other classified industries, making a total of 200 establishments, and $801,062,300 in products. At the census of 1914 there were 160 blast furnace establishments, with products valued at $317,654,000. The increase was 151 per cent. The 1914 figures include blast furnace ferroalloys, spiegeleisen, ferromanganese, etc. (329,580 tons), which are not included in the pig iron figures for 1919, hence the actual growth is somewhat greater than above indicated. The producers consumed in their steel furnaces, etc., 71 per cent of the production in 1919 and 66.6 per cent in 1914.

Tonnage figures (not quoted here) differ from those of the American Iron and Steel Institute, published on page 987, THE IRON AGE, April 1, 1920. Consumption of iron ore in 1919 was reported by the Census Bureau at 56,333,358 tons, costing $310,981,100, and in 1914, 43,326,817 tons, costing $150,855,700. Less than 1 per cent of the tonnage was foreign ore in 1919, as compared with 4.1 per cent in 1914. These results show 4133 lb. of ore per ton of pig iron in 1919, and 4180 lb. in 1914. Coke and coal to the amount of 34,654,421 net tons were reported consumed in 1919, being 2293 lb. per ton of product. In 1914, the 26,982,293 tons consumed represented 2347 lb. per ton of product.

Cylinder Reboring Tool

The International Purchasing & Engineering Co., 49 Garfield Building, Detroit, is marketing the Van Dresser cylinder reboring tool shown in the accompanying illustration.

The tool is operated either by hand through the feed mechanism provided or by power, in which case the feed mechanism is disconnected and the feed shaft attached to the spindle of a drilling machine. A feature is the rack teeth provided for the feed shaft, instead of the screw incorporated in the usual design. After reaming to the desired depth the feed mechanism may be released and the feed bar lifted or dropped out. This arrangement, it is pointed out, eliminates the labor of turning the shaft in removing or backing up the reboring tool. A floating driving socket is provided when the tool is used in connection with a drilling machine, a provision intended to eliminate inaccuracy due to misalignment of the reboring tool.



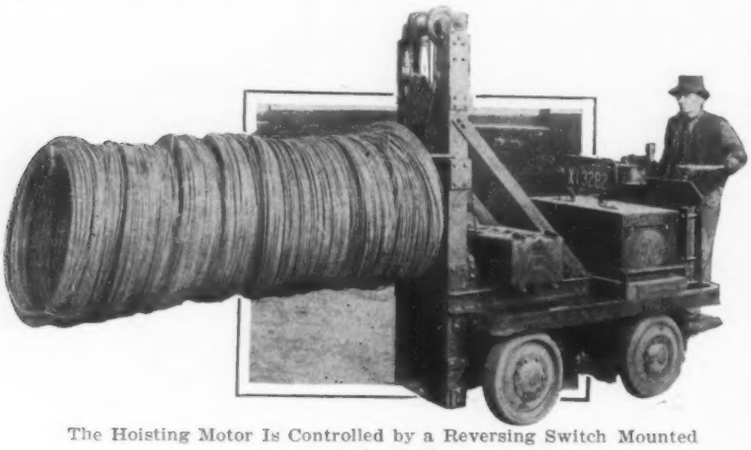
After Reaming, the Feed Mechanism Can Be Released and the Feed Bar Lifted or Dropped Out

The reamer blades are of high speed steel and the reamer head has a taper shank which is drawn into the feed shaft by a screw. The reamer head does not have to be removed from the feed shaft in order to adjust the reamer blades. The reboring tool may be quickly removed without disturbing the base, a feature which permits the operator to try the fit of the piston before boring all the way through.

Truck for Handling Coiled Wire

A special type of industrial storage battery truck has recently been placed in use by one of the large wire mills for handling coiled wire. This truck, which is designated as the Baker ram truck, is being built by the Baker R. & L. Co., Cleveland, and was originally designed for use in the rubber industry for handling heavy iron cores and tire molds. As some of the latter weigh several hundred pounds their handling is difficult without proper equipment. With the truck shown in the accompanying illustration the molds are picked up from the floor with the carrier and readily transported from one part of a plant to another and placed in racks or on pegs.

The mechanism of the truck includes a carriage mounted on rollers running vertically between channel guides and lifted by an electrical cable hoist. The



The Hoisting Motor Is Controlled by a Reversing Switch Mounted on the Dash

carrier is a steel tube 4½ in. in diameter, 36 in. long and has a lip on the end to prevent its load from slipping off. It has an upward and downward movement of 28 in., or sufficient to lift the load clear from the floor, but can be supplied with a greater lift. The hoisting motor is controlled by a small reversing switch mounted on the dash, and its operation in both directions is limited by suitable switches. The truck has a capacity of 2500 lbs., spaced evenly on the carrier. It is stated that the truck is applicable for handling car wheels, machine parts and for other handling service throughout a plant.

"Pittsburgh Plus" Denounced

Denouncing the "Pittsburgh plus" system as a "deceptive price adjustment," and as serving to "restrain the development of the manufacturing of steel products in the West," the lower house of the Missouri Legislature at Jefferson City unanimously adopted a resolution calling on the Federal Trade Commission to direct that the practice shall cease. The resolutions follow:

"Whereas, the producers of rolled steel products, which are the foundation of our industrial life, have established and do maintain a deceptive price adjustment known as the 'Pittsburgh plus' system, which compels the producers of finished steel products to pay excessive prices on their raw product; and, whereas, the said price adjustment includes a fictitious freight cost which, in fact, is not incurred for actual transportation; and, whereas, the said 'Pittsburgh plus' system has served to restrain the development of the manufacturing of steel products in the West, and has served to retard the growth of competition in this important industry, which works an unjust hardship on the manufacturers of this State, and also on the agricultural interest, which are among the largest consumers of iron and steel products;

"Therefore, be it resolved, that the facts and conditions in relationship to said 'Pittsburgh plus' practice are such as to warrant an order from the Federal Trade Commission directing that the said practice shall cease; and, be it further resolved, that the attorney general of the State of Missouri be and he is hereby requested and directed [illegible] ene in the proceedings now pending befo [illegible] Trade Commission, and such further [illegible] as may hereafter follow with respect to such trade practice, and to represent and protect the interest of the people of the State of Missouri; and be it further resolved, that a duly authenticated copy of this resolution be transmitted to the Federal Trade Commission."

New England Iron and Hardware Association

Fred L. Avery, Avery & Saul, South Boston, sheet iron, was re-elected president New England Iron & Hardware Association at the annual meeting held at Young's Hotel, Boston, Tuesday evening, June 21; Myron B. Damon, Fitchburg Hardware Co., Fitchburg, Mass., vice-president; Charles H. Breck, Joseph Breck & Sons Corporation, Boston, treasurer; and George J. Mulhall, clerk and assistant treasurer.

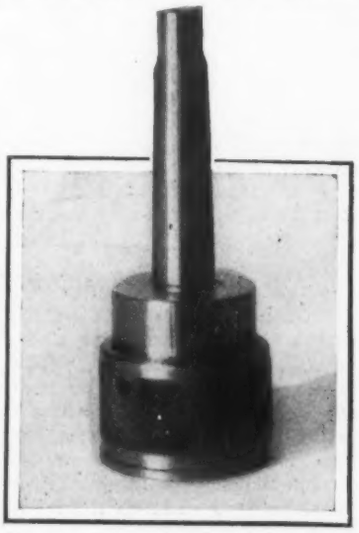
The following constituting the board of directors, were elected: Charles A. Adams, J. B. Varick Co., Manchester, N. H.; Fred L. Avery, Avery & Saul, South Boston; R. M. Boutwell, Standard Horse Shoe Co., South Wareham, Mass.; Charles F. Bragg, N. H. Bragg & Sons, Bangor, Me.; E. R. Brayton, Belcher & Loomis Hardware Co., Providence, R. I.; Myron B. Damon, Fitchburg Hardware Co., Fitchburg, Mass.; Charles A. Haines, Dodge Haley Co., Boston; George M. Gray, Peter Gray & Sons, Cambridge, Mass.; Charles W. Henderson, Arthur C. Harvey Co., Boston; A. B. Marble, Jones & Laughlin Steel Co., Boston; Clarence C. Dodge, George F. Blake Mfg. Co., Cambridge, Mass.

Various committee reports were submitted, that of the general hardware committee having an optimistic tone. During the year ended May 31, last, the association made a net gain of two in membership, which now stands at 93. Some 30 stockholders and associate members attended the meeting.

Chuck for Broken Drill Shanks

A chuck for holding twist drills which have been broken at the shank is being placed on the market by the Wayne Tool Mfg. Co., Waynesboro, Pa.

The chuck is composed of but six parts, viz; shank, casing, two pawls, two screws and a casing plate. The drill to be used is ground to a 60 deg. point at the broken end to allow it to automatically center itself on a 60 deg. recess in the shank. Then by turning the casing the drill is locked in place by two pawls gripping the drill about the grooves. No wrench is required to tighten or release the chuck.



Turning the Casing Locks the Drill in Place

The Sharon Pressed Steel Co., Sharon, Pa., of which H. W. Torney of New York is president, is now in position to manufacture and deliver automobile and truck frames up to 1500 per day, officials announce. A 4000-ton Mesta press was recently added to the equipment. The general manager in charge of production is Arthur W. Swan, formerly of the Crucible Steel Co. of America.

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ESTABLISHED 1855

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Improved Railroad Outlook

The stirring address made by President James A. Campbell of the Youngstown Sheet & Tube Co., of which a report appears elsewhere in this issue, was an able and courageous discussion of a most important topic. Certainly it cannot be included as a part of that agitation to which President Alba B. Johnson of the Railway Business Association objected at Washington, because it is not an endeavor to pass upon or influence the decision of any question pending before the Interstate Commerce Commission. It is rather an appeal to the public, to officials and to all having responsibilities connected with the solution of railroad problems to deal justly and to bring about as quickly as possible improved conditions in the business world.

Some of Mr. Campbell's suggestions, such as that proposing the abolition of the United States Railroad Labor Board, are not likely to be carried out, at least until the board is given a trial for a considerable time, for that body is doing its part in bringing about the readjustment of wages. Its latest announcement that its wage reduction order, effective July 1, has been extended to virtually every large railroad in the country, covering nearly all classes of employees and meaning a saving of $400,000,000 per year in the pay rolls of the carriers, will meet with general approval.

And this is not the only favorable news in regard to the railroad situation, for the action of President Harding in taking an active part in bringing about an early adjustment of claims of the railroads against the Government is a most important step in the right direction. As Mr. Johnson pointed out in his interview after seeing the President, industrial unemployment is made worse and more protracted by the inability of the railroads to pay the bills of the railroad supply manufacturers and if, as proposed, substantial payments aggregating probably $200,000,000 can soon be made by the Government, it will relieve the situation appreciably. The plan of permitting the railroads to issue bonds to meet a part of their obligations to the Government for capital expenditures would also be an important means of relief.

Patience will still be needed, as the many complications growing out of the war and Government operation of the railroads will require time for adjustment; but the signs of a disposition to cut red tape so that the period of distress in industry may be shortened are more encouraging to business than anything that has come out of Washington in many days.

The New Iron and Steel Tariff

The tariff bill now shaping up at Washington has had less attention from manufacturers, it is safe to say, than any of its predecessors. So far as iron and steel is concerned there has been nothing that faintly suggests the strenuous efforts of manufacturers in the old days to get congressmen to recognize the necessity for making the metal schedules adequately protective. Producers of iron and steel were notified some time ago of the fact that the new metal schedule was in course of preparation, and that if they had any information to lay before the Ways and Means Committee it would have due consideration. Some few have responded, but generally it seems to have been taken for granted that any changes made by the majority party would be in the direction of more rather than less protection.

In the old days the iron and steel trades took an active interest in the metal schedule and impressed upon the Ways and Means Committee their views concerning every paragraph having to do with iron and steel products. The Morrill tariff and later the McKinley tariff represented in the main the consensus of the industry—employers and employees (the latter as represented by the Amalgamated Association of Iron and Steel Workers, headed by John Jarrett) as to the amount of protection required to restrict the admission of foreign pig iron or foreign finished or semi-finished steel to the United States. Apart from the Wilson bill of 1893, which in its final evolution became the Brice-Gorman act, and the Underwood-Simmons act of 1913, the tariffs of the past 50 years have been built on the principle of protection. The two exceptions noted, while ostensibly "revenue only" measures, may properly be classed in respect to many of their schedules as

tariffs for revenue, with incidental protection.

The Underwood bill was drawn with scant regard to any protection for iron and steel. Pig iron and billets and a number of finished products, including wire nails, barbed wire, galvanized wire fencing, wire used for baling, cotton ties and steel rails, were put on the free list. The theory was that the farmer would be benefited by free wire products and cotton ties, and it was contended in the debates that rails, being a "monopoly" product, should carry no duty. There were evidences in 1913 and in 1914 that some foreign steel products were likely to get a foothold on the Atlantic and Pacific seaboards and at Gulf ports, under the low rates of the Underwood-Simmons act. But the war came on, the whole steel movement was in the direction of Europe, and the tariff was forgotten.

The war experience of the American steel industry, in several of its phases, has raised issues on which the framers of the new metal schedule have already encountered some sharp differences of interest and view. For example, a duty of $22.40 per gross ton, or one cent per pound, on ferromanganese, which some of its domestic producers ask for, represents an abrupt step from the free-list provision of the present tariff, or from the $2.50 and $4 duty of the two preceding acts. The magnesite industry and the importers of magnesite make sharply contradictory representations; and some of the ferroalloys that came into new prominence in war-time through the development of domestic ore supplies have brought out opposing views which the Ways and Means Committee have not found it easy to reconcile.

That the metal schedule of the tariff bill now about to be reported to the House will provide, for the most part, specific duties on iron and steel, in contrast with the ad valorem provisions (generally around 15 per cent) of the Underwood act has been the general expectation. That, in view of the tendency to under-valuation, is a natural move of a majority favorable to protection. However, the old-time issue of under-valuation cuts a small figure in the present juncture, in comparison with the possibilities growing out of the low exchange standing of all our European competitors in iron and steel, particularly Germany. Thus the administrative features of the new tariff will be quite as important as the schedules themselves.

During the war considerable was heard of the use of calcium carbide as a deoxidizer in place of ferromanganese in steel making. The Germans were said to have discovered this and to be using it on a large scale. It was claimed that the steel bath breaks up the carbide, liberating free calcium which in turn displaces the iron of the ferrous oxide, forming lime which passes into the slag. It was said also that the calcium of the carbide would combine, like manganese, with the sulphur and assist in its removal. According to the London *Ironmonger*, comparative trials on a practical scale, using the carbide and ferromanganese, have shown the consumption of manganese to be the same in either case, with the calcium carbide practically inoperative, the reason being that the low specific gravity of the latter causes it to rise to the surface before performing any function. The ultimate use of carbide successfully is, however, expected under certain definite physical and chemical conditions. These experiments are pointed to as showing that the "discoveries" of the Germans are unfounded. In any event the present abundance of ferromanganese precludes any desire to use anything else, stocks in this country and abroad being very heavy and high-grade ore also plentiful.

Better Cast-Iron Car Wheels

The vital rôle played by the chilled cast-iron wheel in the country's commerce and the need for chemical specifications to insure better wheels were emphasized anew at the annual meeting of testing engineers at Asbury Park last week. In six years losses on railroads from accidents have increased over 200 per cent, or from $33,000,000 in 1913 to $106,000,000 in 1919, due in large measure to poor cast-iron wheels. A large number of these wheels have proved to be of faulty composition and the situation is so serious that concerted action for the adoption of chemical and other specifications is necessary. This matter was brought to a focus at the annual convention and was easily the most vital subject of the steel and iron sessions.

There is some surprise that the adoption of chemical specifications for cast-iron wheels by the American Society for Testing Materials is not already an accomplished fact, but it appears to be one of those matters on which producers in particular and consumers in general have been unable to agree. The regulation of the sulphur and phosphorus contents is a vital point in such a specification; but the problem of composition, which is easy for some Eastern foundries and less easy for some Southern and far Western makers, has been a stumbling block. Whether a maximum of 0.30 to 0.32 per cent phosphorus insures a safer wheel or whether as high as 0.40 per cent phosphorus can be tolerated in the interest of Southern foundries is a matter of importance. It was the opinion of experts at last week's meeting that 0.32 per cent phosphorus as a maximum is the most desirable.

The sulphur question is also difficult. That a maximum of 0.18 per cent sulphur is best and that a manganese content three times the sulphur is necessary were generally conceded. Too high a combined carbon is known to be very detrimental; yet there were cited cases of many wheels in service or failed whose combined carbon content far exceeded safe limitations. That cases of failed wheels are seriously numerous, in which the content of phosphorus and sulphur was beyond reasonable limits of safety, is brought out by H. J. Force in his paper printed elsewhere.

The suggestion of a stipulated percentage of nickel and chromium in cast-iron wheels, as offered by Mr. Force, is of more than passing interest. There are certain to be important developments in the near future in alloyed cast iron

and it is not improbable that nickel-chrome chilled cast-iron wheels will become an important factor in railroad engineering.

There is also the suggestion that the phosphorus and sulphur question, as well as some cupola troubles, may be solved by the use of the basic electric furnace in conjunction with the cupola. Doctor Moldenke's opinion that this would directly and immediately solve most of the problems involved was strongly emphasized. As in steel rails so also in chilled wheels the time may come when the expense of making a better product will not militate against the general adoption of a new process.

The testing society has taken a commendable step in the tentative chemical and other specifications for cast-iron wheels and in the interests of the public it is hoped that makers and buyers can agree on something efficient. The co-operation of the association of the largest makers of wheels in this country and Canada, as demonstrated at the meeting last week, is a promising sign.

Finished Steel in 1920

The detailed statistics of finished steel production in 1920, just presented by the American Iron and Steel Institute, furnish interesting information on the character of the year's industrial activities. The general totals, of ingots and rolled material, were discussed in THE IRON AGE last week.

There were some curious vagaries in production in the four particularly large years for output, 1916, 1917, 1918 and 1920, the variations in these years, one from another, being only a few per cent. In steel ingots 1920 stood fourth. In rolled iron and steel the year stood third, being exceeded by 1916 and 1917. In rolled steel alone, however, 1920 was second, being exceeded only by 1917. The production of shell steel during the war was responsible for these divergences, causing the ingot production to run farther than normal above the rolled steel production, shell steel ingots having been heavily cropped. Rolled iron complicated the matter, by being half a million tons, or about 27 per cent, less in 1920 than in 1916 or 1917, so that the total of rolled iron and steel did not show up as well in 1920 as the total of rolled steel.

In 1920 production was: Rolled iron, 1,377,566 gross tons; rolled steel, 30,970,297 tons; total rolled, 32,347,863 tons. The proportions were 4.3 per cent iron, 95.7 per cent steel.

It is convenient to consider rolled iron and steel together. The 1920 production, while a trifle short of output in two of the war years, was 31 per cent above the production in the two heaviest pre-war years, 1912 and 1913, which held closely together, and 65 per cent above the production in 1906, which was a year of full activity, all the capacity existing at the time being strenuously employed. The 1920 production of rails, however, 2,604,116 tons, was only 65 per cent of the 1906 production, which stands as the high record, and it was 76 per cent of the production in 1912 and 1913. There was approximately enough relaying of rails in 1920 to equal one year of wear on existing rails, but there was practically no laying of additional track.

Structural shapes, on the other hand, with 3,306,748 tons, made a new high record, naturally passing the output in the war years, but exceeding the output in 1912-13 by 13 per cent, when the output of all rolled material increased 31 per cent. Noting the very small production of steel cars in 1920 as compared with the pre-war years, it may be assumed that the consumption of structural shapes in general construction work made a very fair gain last year over any pre-war rate. That is not in accordance with much that has been said and written about construction work in 1920.

The production of wire rods in 1920 was 23 per cent above the 1912-13 average, showing not a bad gain. The production of nails alone showed a 17 per cent gain.

There were no statistics of pipe production in 1912 or previous years. The production of all welded tubular goods in 1920, 3,002,725 tons, showed a gain of 35 per cent over 1913. In oil country goods alone, the gain was just 50 per cent, from 841,089 tons in 1913 to 1,261,778 tons in 1920. The heavy demand for oil country goods in 1920, and even in 1919, was much commented on at the time.

Sometimes an impression dies hard, and the old relation of rails standing very high in the list of iron and steel industry products, has had undeserved longevity, for it seems to be thought in some quarters that rails have been displaced only temporarily. It will be noted that structural shapes, rods and pipe are all far ahead of rails. That is not all, however. Sheared plates ¼-inch and heavier amounted to 2,904,627 tons in 1920, or well in excess of the 2,604,116 tons of rails. In addition there was 600,737 tons of sheared plates, under ¼-inch, also 1,249,769 tons of universal plates, making 4,755,133 tons of all classes of plates, this comparing with 3,002,770 tons in 1913, showing a 58 per cent gain. Even sheets exceeded rails, with 2,886,401 tons, and this does not include the 1,696,146 tons rolled on "tin" mills, chiefly for making tin plate.

One of the surprises from an analysis of recent export statistics is the large purchases by China of American steel, machinery and locomotives. For the 10 months ended with April exports of locomotives to China were six times what they were two years ago, or 74 against 12, while purchases by China of steel rails for the same period were 33,643 gross tons against only 7717 tons and 4831 tons in the same periods in 1920 and 1919 respectively. Nearly twice as much metal-working machinery went to China in the 10 months ended with April as in the corresponding months in 1919 or 1920, while, in the case of sewing machines and typewriting machines, the expansion has been about five-fold and two-fold respectively. In all classified grades of finished steel China bought nearly twice as much in the 10-month period to May, this year, as in the like period last year or the year before. The marked increases were in wire nails, structural steel, steel rails, galvanized sheets and cast pipes and fittings. Recent pur-

chases from this country have been far ahead of any pre-war record and are suggestive of the needs and future buying power of the largest republic in the world.

CORRESPONDENCE

Utilize Our Manganiferous Iron Ores

To the Editor: In the article by F. Linwood Garrison entitled "What Tariff Rates on Our Minerals?" in THE IRON AGE of June 23, the shortage of domestic high grade manganese ores and the need of a practice to consume our manganiferous iron ores are clearly shown.

During the war the cutting off of the great Russian manganese ore supply and the difficulty of importing manganese ore from India and Brazil, because of lack of shipping, the production of domestic ores and changes in steel-making practice to permit less ferromanganese to be used were serious considerations of the Government. An effort was made to substitute spiegeleisen for ferromanganese, as the lower grade domestic ores could be used for the former. Although very high prices were paid for manganese per unit, no important deposits of high grade ore were developed.

There are practically all over the country deposits available of manganiferous iron ore, with manganese too high for foundry and ordinary basic iron; for this reason these ores are cheaper than iron ore. The aggregate tonnage of manganese in these ores is large.

If high manganese pig iron, made by the addition of manganiferous iron ore, were used in the open-hearth steel furnace charge a high initial manganese would be had in the bath to cleanse it of oxides and more or less of the sulphur, and a residual manganese of 0.3 per cent would be left in the steel. This would require less ferro-manganese to be added to the steel and consequently less high grade manganese ore would be needed.

Manganese is put into spiegeleisen by the use of extra coke to obtain the necessary temperature in the blast furnace. This manganese is diluted by the subsequent addition of iron, to 6 or 8 per cent from 20 to 30 per cent. Pig iron of 6 to 8 per cent manganese could be made at not much greater cost than ordinary pig iron as the consumption of coke would not be very much greater and manganiferous iron ores, not suitable for making foundry and standard basic pig iron, are in some sections cheaper than iron ores.

WALTER GRAHAM.

New York, June 27, 1921.

Wages and Cost of Living

To the Editor: James O'Connell, president of the metal trades department of the American Federation of Labor, offers a few remarks which remind one of the column in a certain New York daily which bears the caption "The Day's Best Laugh." For example, Mr. O'Connell in his annual address declared that it was unscientific and impossible to base wage reductions accurately on the cost of living. What wonderfully good sportsmen these labor leaders are—always ready to change the rules of the game whenever those rules happen not to operate in their favor.

Our memory may be failing us, but it seems not so very long ago that we were confronted with a mass of statistics on the cost of living and told that wages must be advanced because of the advance in living cost. In almost no instance was a request for more money based on the argument that the work being done was worth more. And now we are frankly told that it was all a mistake, for it is cold logic that if it is unscientific and impossible to base a reduction of wages on the cost of living, by the same token wages should never have been advanced on that basis.

By such deep thinkers are the rank and file of the unions led. Mr. O'Connell made some other remarks which cannot be classed as amusing. He stated that labor had not gouged the Government nor *in any way* profiteered. What, pray, was given in exchange for the one hour extra pay per week for punching the clock? What was given in exchange for the overtime paid a member of a building trades union for a Saturday afternoon and Sunday, not one minute of which was spent on the job? What was given—but what's the use?

H. D. MURPHY.

Medford Hillside, Mass., June 23, 1921.

Wage in New York State

Figures from the New York State Industrial Commission show that wages in factories in the group labeled "Metals, Machinery and Conveyances" were $28.33 per week, on the average, during April, compared with $30.48 in April, 1920, and $12.74 in April, 1915. The average factory wage in the State was $26.20 per week in April, compared with $27.80 last year and $12.54 in 1915.

Wages are shown to have been 106 per cent higher in April, 1921, than in June, 1914, having fallen 22 "points" from the maximum of 128 per cent excess last October. During that same period the retail price of food has fallen from 100 per cent excess over June, 1914, to 54 per cent. Food which cost in April the earnings of 8 hr. of labor would have cost 9 hr. 23 min. last October, 10 hr. 34 min. last July and 10 hr. 42 min. in June, 1914.

Belgian Billets Offered

YOUNGSTOWN, OHIO, June 28.—A district steel manufacturer states that billets manufactured in Belgium are now being offered, duty paid, at Baltimore for $31.50 a metric ton of 2204 lb., as compared with a minimum price of $35 per gross ton of 2240 lb., Youngstown mill. Inasmuch as the freight charge from Baltimore to Youngstown is about $6 per ton, it would cost about $37.50 a metric ton or $38 a gross ton to lay the billets down in the Valley. This compares with the stabilized quotation of $39, which it is generally recognized is being shaded.

Interior manufacturers can therefore produce and ship such material at a lower price than that quoted by the Belgian competitor, though seaboard consumers are able to purchase such product more cheaply than from domestic makers situated as far inland as the Pittsburgh or Youngstown districts.

The Iron Age and Its Readers

With this number is brought to a close volume 107 of THE IRON AGE. Reading pages for the 26 issues of the first half of 1921 totaled 1806, or within 14 of being an average of 70 per week. The last seven issues, including this one, averaged 74 pages. Replete with news, reports, and technical and economic contributions—all calculated to advance the industry—they served directly and indirectly to hasten the return to more nearly normal business activity.

There has been a balancing in these issues of the interest of iron and steel making, founding, stamping, forging, metal cutting and other phases of metal working, covering design and equipment of plants, processing, management, buying and selling and related factors involved in the operation of the country's metalworking industry. Space might well be taken for enumerating some of the important articles. The hope is they have not been overlooked.

Detailed Statistics of Rolled Iron and Steel Produced in the United States in 1920

In THE IRON AGE of June 23 were given the official statistics of steel ingot production in the United States in 1920, together with a summary of the output of finished iron and steel. Additional tables showing that in some lines new records were made last year are given below. Of the total output of rolled products last year 42.41 per cent was contributed by Pennsylvania, against 45.72 per cent in 1919:

PRODUCTION OF ALL KINDS OF FINISHED ROLLED IRON AND STEEL, BY STATES, GROSS TONS, 1916-1920.

States.	1916.	1917.	1918.	1919.	1920
Maine, Mass	217,589	218,962	181,113	203,033	225,479
Rhode Island, Conn	75,111	81,255	81,317	79,523	105,051
New York	1,322,988	1,492,769	1,640,182	974,928	1,562,058
New Jersey	235,739	238,972	217,480	204,180	218,903
Pennsylvania	15,428,563	15,018,871	13,836,445	11,477,176	13,718,265
Delaware, Virginia	37,337	62,403	41,584	79,279	103,438
Maryland	385,708	368,458	416,213	241,914	458,577
West Virginia	777,328	831,594	731,477	682,017	957,242
Kentucky, North Car. Tennessee, Ga., Texas	332,797	322,444	239,224	184,675	306,822
Alabama	856,445	884,500	755,468	709,697	896,418
Ohio	5,846,024	6,141,465	6,171,332	4,975,254	6,454,004
Indiana	2,919,004	3,135,689	2,844,429	2,607,547	3,499,855
Illinois	2,686,674	2,713,428	2,470,223	1,679,107	2,487,085
Michigan, Wisconsin, Minn	471,802	696,605	733,038	414,602	514,768
Mo., Iowa, Okla., Kan.	150,603	146,386	115,085	103,803	151,772
Colorado, Utah, Wash.	518,043	573,660	514,170	355,138	490,609
California, Canal Zone	118,634	140,239	166,974	129,671	197,517
Total	32,380,389	33,067,700	31,155,754	25,101,544	32,347,863

PRODUCTION OF FINISHED ROLLED IRON AND STEEL BY LEADING PRODUCTS, GROSS TONS, 1920.

Products	Iron.	Steel.	Total.
Rails	.....	2,604,116	2,604,116
Plates and sheets	34,111	9,303,569	9,337,680
Nail and spike plate	.....	20,577	20,577
Wire rods	4,721	3,132,186	3,136,907
Structural shapes	488	3,306,260	3,306,748
Merchant bars	663,032	5,467,208	6,130,240
Bars for reinforced concrete work	698	571,747	572,445
Skelp, flue, and pipe iron or steel	252,403	2,967,886	3,220,289
Hoops	.....	333,440	333,440
Bands and cotton-ties	3,345	385,517	388,862
Long angle splice bars, tie-plate bars, etc	53,636	522,194	575,830
Rolled sheet piling, not including fabricated	.....	20,716	20,716
Railroad ties	.....	26,310	26,310
Rolled forging blooms, forging billets, etc.	258	447,076	447,334
Blooms, billets, sheet bars, etc., for export	.....	136,457	136,457
All other finished rolled products	364,874	1,725,038	2,089,912
Total Gross tons.	1,377,566	30,970,297	32,347,863

In addition to the 20,716 tons of rolled sheet piling above reported there were produced by rolling mills and steel works in 1920 about 3,941 tons of fabricated sheet piling, as compared with 3,773 tons of the same kind of piling in 1919.

PRODUCTION OF STRUCTURAL SHAPES, GROSS TONS, 1894-1920

Years.	Tons.	Years.	Tons.	Years.	Tons.
1894	360,305	1903	1,095,813	1912	2,846,487
1895	517,920	1904	949,146	1913	3,004,972
1896	495,571	1905	1,660,519	1914	2,031,124
1897	583,790	1906	2,118,772	1915	2,437,003
1898	702,197	1907	1,940,352	1916	3,029,964
1899	850,376	1908	1,083,181	1917	3,110,000
1900	815,161	1909	2,275,562	1918	2,849,969
1901	1,013,150	1910	2,266,890	1919	2,614,036
1902	1,300,326	1911	1,912,367	1920	3,306,748

PRODUCTION OF HEAVY AND LIGHT STRUCTURAL SHAPES, GROSS TONS, 1913-1920.

Years.	Heavy shapes.	Light shapes.	Total.	Years.	Heavy shapes.	Light shapes.	Total.
1913	2,553,806	451,166	3,004,972	1917	2,575,810	534,190	3,110,000
1914	1,787,281	243,843	2,031,124	1918	2,438,126	411,843	2,849,969
1915	2,031,407	405,596	2,437,003	1919	2,136,424	477,612	2,614,036
1916	2,649,961	380,003	3,029,964	1920	2,741,120	565,628	3,306,748

Almost all the heavy structural shapes were rolled from ste.

PRODUCTION OF PLATES AND SHEETS BY SIZE AND MODE OF MANUFACTURE, GROSS TONS, 1920.

Kinds of products.	Iron.	Steel.	Total.
Universal plates, inc. flats or bars over 6 in. wide:			
¼ of an inch and over in thickness	3,640	1,123,405	1,127,045
Under ¼ of an inch thick	.....	122,724	122,724
Total universal plates	3,640	1,246,129	1,249,769
Sheared plates:			
¼ of an inch and over in thickness	844	2,903,783	2,904,627
Under ¼ of an inch thick	76	600,661	600,737
Total sheared plates	920	3,504,444	3,505,364
Black sheets, made on either sheet or job. mills:			
No. 12 gauge and thicker	959	366,370	367,329
No. 13 gauge and thinner	26,831	2,492,241	2,519,072
Total black sheets	27,790	2,858,611	2,886,401
Black plates rolled on tin mills:			
Black plates for tinning	.....	1,467,389	1,467,389
Other black plate specialties	1,761	226,996	228,757
Total black plates rolled on tin mills	1,761	1,694,385	1,696,146
Grand total of plates and sheets	34,111	9,303,569	9,337,680

PRODUCTION OF SHEARED PLATES ACCORDING TO MODE OF MANUFACTURE, GROSS TONS, 1920

Mode of manufacture.	Iron.	Steel.	Total.
Sheared plates, rolled on single stands of rolls:			
¼ of an inch and over in thickness	844	2,621,287	2,622,131
Under ¼ of an inch thick	76	221,629	221,705
Total rolled on single stands	920	2,842,916	2,843,836
Sheared plates, roughed and fin. on sep. stands:			
¼ of an inch and over in thickness	.....	282,496	282,496
Under ¼ of an inch thick	.....	379,032	379,032
Total roughed and fin. on sep. stands	.....	661,528	661,528
Total sheared plates	920	3,504,444	3,505,364

PRODUCTION OF UNIVERSAL PLATES BY WIDTHS, SHOWING IRON AND STEEL SEPARATELY, GROSS TONS, 1920.

Width of universal plates.	Iron.	Steel.	Total.
Under 30 inches wide	3,640	976,498	980,138
30 inches wide, but under 48 inches wide	.....	178,186	178,186
48 inches wide and over	.....	91,445	91,445
Total	3,640	1,246,129	1,249,769

PRODUCTION OF PLATES AND SHEETS BY KINDS, 1919-1920.

Kinds	1919—Gross tons.			1920—Gross tons.		
	Iron.	Steel.	Total.	Iron.	Steel.	Total.
Universal plates*	2,199	989,855	992,054	3,640	1,246,129	1,249,769
Sheared plates—						
Rolled on single stands	503	2,373,193	2,373,696	920	2,842,916	2,843,836
Roughed and fin. on sep. stands	3,070	522,501	525,571	.....	661,528	661,528
Black sheets rolled on sheet or job. mills	34,712	2,065,128	2,099,840	27,790	2,858,611	2,886,401
Black plates, inc. black plates for tinning and black plate specialties rolled on tin mills	144	1,381,509	1,381,653	1,761	1,694,385	1,696,146
Total	40,628	7,332,186	7,372,814	34,111	9,303,569	9,337,680

*Include flats and bars over 6 inches wide.

PRODUCTION OF IRON AND STEEL GALVANIZED SHEETS AND GALVANIZED FORMED PRODUCTS, 1913-1920.

Years.	Galvanized sheets.	Galvanized formed products*	Total. Pounds.
1913	1,845,864,365	129,189,480	1,975,053,845
1914	1,807,667,129	131,603,609	1,939,270,738
1915	1,581,569,206	112,192,790	1,693,761,996
1916	1,346,924,950	130,302,195	1,477,227,145
1917	1,273,978,805	114,902,171	1,388,880,976
1918	1,159,778,807	121,110,267	1,280,889,074
1919	1,500,575,548	140,494,884	1,641,070,432
1920	1,871,360,951	143,894,730	2,015,255,681

*Articles formed or stamped from iron or steel black plates or black sheets and galvanized after the completion of the forming or stamping process.

PRODUCTION OF MERCHANT BARS, SHOWING IRON AND STEEL MERCHANT BARS SEPARATELY, GROSS TONS, 1905–1920.

Years.	Iron.	Steel.	Total.	Years.	Iron.	Steel.	Total.
1905..	1,322,439	2,271,162	3,593,601	1913..	1,026,632	2,930,977	3,957,609
1906..	1,481,348	2,510,852	3,992,200	1914..	563,171	1,960,460	2,523,631
1907..	1,440,356	2,530,632	3,970,988	1915..	657,107	3,474,135	4,131,242
1908..	685,233	1,301,405	1,986,638	1916..	993,948	5,236,354	6,230,302
1909..	952,230	2,311,301	3,263,531	1917..	983,926	5,226,031	6,209,957
1910..	1,074,163	2,711,568	3,785,731	1918..	846,898	5,395,851	6,242,749
1911..	835,625	2,211,737	3,047,362	1919..	446,549	3,945,075	4,391,624
1912..	944,790	2,752,324	3,697,114	1920..	663,032	5,467,208	6,130,240

PRODUCTION OF CONCRETE BARS, SHOWING IRON AND STEEL CONCRETE BARS SEPARATELY, GROSS TONS, 1909–1920.

Years.	Iron.	Steel.	Total.	Years.	Iron.	Steel.	Total.
1909..	.....	159,352	159,352	1915..	.....	353,408	353,408
1910..	4,645	236,464	241,109	1916..	2,683	458,717	461,400
1911..	2,388	256,353	258,741	1917..	1,497	469,687	471,184
1912..	2,500	271,832	274,332	1918..	468	344,152	344,620
1913..	113	319,557	319,670	1919..	2,295	416,726	419,021
1914..	.....	288,471	288,471	1920..	698	571,747	572,445

PRODUCTION OF BLACK PLATES FOR TINNING, SHOWING IRON AND STEEL SEPARATELY, GROSS TONS, 1904–1920.

Years.	Iron.	Steel.	Total.	Years.	Iron.	Steel.	Total.
1904..	2,981	469,588	472,569	1913..	2,779	824,487	827,266
1905..	3,152	504,435	507,587	1914..	2,272	935,909	938,181
1906..	5,666	570,413	576,079	1915..	2,038	1,091,307	1,093,345
1907..	3,161	500,911	504,072	1916..	1,878	1,281,924	1,283,802
1908..	2,954	510,817	513,771	1917..	655	1,513,117	1,513,772
1909..	4,261	602,221	606,482	1918..	.....	1,502,690	1,502,690
1910..	2,893	709,244	712,137	1919..	144	1,165,292	1,165,436
1911..	3,515	792,083	795,598	1920..	.....	1,467,389	1,467,389
1912..	5,378	976,819	982,197	.....	.....	.....	.....

PRODUCTION OF TINPLATES AND TERNE PLATES, 1891–1920.

Years.	Tinplates.	Terne plates.	Total pounds.
1891 (second 6 months).....	368,400	1,868,343	2,236,743
1892 (calendar year).....	13,921,296	28,197,896	42,119,192
1893.....	64,536,209	59,070,498	123,606,707
1894.....	102,223,407	64,120,002	166,343,409
1895.....	165,927,907	88,683,488	254,611,395
1896.....	270,151,785	89,058,013	359,209,798
1897 (first 6 months).....	203,028,258	49,545,643	252,573,901
1897 (second 6 months).....	.....	.....	322,205,619
1898 (calendar year).....	.....	.....	732,289,600
1899.....	.....	.....	808,360,000
1900 (cen. year end. May 31).	707,718,239	141,285,783	*850,004,495
1901 (calendar year).....	.....	.....	894,411,840
1902.....	.....	.....	806,400,000
1903.....	.....	.....	1,075,200,000
1904 (cen. year end. Dec. 31).	867,526,985	158,857,866	*1,032,940,706
1905 (calendar year).....	.....	.....	1,105,440,000
1906.....	1,100,373,000	193,367,000	1,293,740,000
1907.....	996,650,000	156,447,000	1,153,097,000
1908.....	1,048,896,000	154,179,000	1,203,075,000
1909.....	1,179,858,000	190,930,000	1,370,788,000
1910.....	1,450,821,000	168,184,000	1,619,005,000
1911.....	1,597,629,000	158,441,000	1,756,070,000
1912.....	1,965,559,000	191,396,000	2,157,055,000
1913.....	1,708,186,000	136,944,000	1,845,130,000
1914.....	1,939,785,000	146,195,000	2,085,980,000
1915.....	2,201,825,054	163,470,646	2,365,295,700
1916.....	2,552,224,275	214,176,952	2,766,401,227
1917.....	3,233,314,911	153,891,653	3,387,206,564
1918.....	3,216,247,673	85,376,569	3,301,624,244
1919.....	2,407,156,757	170,854,730	2,578,011,487
1920.....	3,079,953,351	138,224,379	3,218,177,730

*Includes 1,000,472 pounds in 1900 and 6,555,855 pounds in 1904 of "other sheet iron and sheet steel, tin or terne plated."

PRODUCTION OF COKE AND CHARCOAL TINPLATES, 1920.

States.	Coke. Pounds.	Charcoal. Pounds.	Total. Pounds.
Pennsylvania.....	1,505,550,876	24,989,398	1,530,540,274
Maryland, West Virginia....	494,141,873	26,010,896	520,152,769
Ohio, Indiana, Illinois.....	1,018,906,531	10,353,777	1,029,260,308
Total.....	*3,018,599,280	61,354,071	3,079,953,351

*Includes a little less than 6,000,000 pounds which were formed or stamped from black plates by a company which manufactures tinplates and tinned after the completion of the forming or stamping process.

PRODUCTION OF FORGED IRON AND STEEL BY ROLLING MILLS AND STEEL WORKS.

Years.	Production—Gross tons.			Years.	Production—Gross tons.		
	Iron.	Steel.	Total.		Iron.	Steel.	Total.
1911..	4,034	214,202	218,236	1916..	3,352	920,415	923,767
1912..	9,155	383,365	392,520	1917..	8,772	1,069,993	1,078,765
1913..	27,892	380,091	407,983	1918..	24,458	1,271,108	1,295,566
1914..	3,675	337,746	341,421	1919..	23,822	510,524	534,346
1915..	2,814	520,909	523,723	1920..	38,063	502,041	540,104

PRODUCTION OF SKELP, SHOWING IRON AND STEEL SKELP SEPARATELY, GROSS TONS, 1905–1920.

Years.	Iron.	Steel.	Total.	Years.	Iron.	Steel.	Total.
1905..	452,797	983,198	1,435,995	1913..	312,746	2,189,218	2,501,964
1906..	391,517	1,137,068	1,528,585	1914..	264,340	1,718,091	1,982,431
1907..	444,536	1,358,091	1,802,627	1915..	262,198	2,037,266	2,299,464
1908..	297,049	853,534	1,150,583	1916..	355,445	2,572,229	2,927,674
1909..	370,151	1,663,230	2,033,381	1917..	336,591	2,337,640	2,674,231
1910..	350,578	1,477,616	1,828,194	1918..	258,500	2,305,511	2,564,011
1911..	322,397	1,658,276	1,980,673	1919..	192,146	2,363,632	2,555,778
1912..	327,012	2,119,804	2,446,816	1920..	252,403	2,967,886	3,220,289

PRODUCTION OF WROUGHT PIPE AND BOILER TUBES, SHOWING IRON AND STEEL SEPARATELY, 1919–1920.

Kinds of pipe.	1919—Gross tons.			1920—Gross tons.		
	Iron.	Steel.	Total.	Iron.	Steel.	Total.
Black standard...	51,682	775,400	827,082	75,066	1,093,702	1,168,768
Galvanized.....	14,661	253,495	268,156	19,560	297,759	317,319
Oil country goods.	73,522	995,392	1,068,914	71,610	1,190,168	1,261,778
O. D. and misc...	.....	120,670	120,670	.....	135,924	135,924
Boiler tubes.....	22,491	67,618	90,109	33,437	85,499	118,936
Total.....	162,356	2,212,575	2,374,931	199,673	2,803,052	3,002,725

In 1920 there were 27 active works, of which 19 made black, 15 made galvanized, 16 made oil country goods, 13 made O. D. and miscellaneous pipe, and 11 made boiler tubes.

PRODUCTION OF SEAMLESS STEEL TUBES, GROSS TONS. 1913–1920.

Years.	Hot finished.	Cold drawn.	Total.	Years.	Hot finished.	Cold drawn.	Total.
1913...	42,740	65,827	108,567	1917...	87,615	139,060	226,675
1914...	36,939	53,656	90,595	1918...	142,308	150,586	292,894
1915...	63,488	76,180	139,668	1919...	75,804	121,505	197,309
1916..	61,235	129,238	190,473	1920...	132,091	159,479	291,570

PRODUCTION OF CAST IRON PIPE, NET TONS, 1919–1920.

Kind of pipe.	1919—Net tons.			1920—Net tons.		
	Pipe.	Fittings.	Total.	Pipe.	Fittings.	Total.
Gas and water*.....	469,735	44,929	514,664	591,692	45,170	636,862
Soil and plumbers'....	142,989	52,428	195,417	183,831	65,822	249,653
Total...	612,724	97,357	710,081	775,523	110,992	886,515

*Includes culvert pipe. Manufacturers able to separate their production report 8,500 tons of culvert pipe in 1920 and 12,577 tons in 1919.

PRODUCTION OF HAMMERED CHARCOAL IRON BLOOMS, BILLETS, ETC.

Years.	For sale.	For own use.	Total. Gross tons.	Years.	For sale.	For own use.	Total. Gross tons.
1911...	2,271	70,345	72,616	1916..	5,405	95,280	100,685
1912...	250	75,557	75,807	1917..	7,841	103,284	111,125
1913...	80	71,313	71,393	1918..	8,300	74,787	83,087
1914...	5,026	46,399	51,425	1919..	1,027	31,210	32,237
1915...	902	57,219	58,121	1920..	2,731	59,893	62,624

PRODUCTION OF WIRE NAILS IN 100 LB. KEGS, 1890–1920.

Years.	Production.	Exports.	Consumption.	Years.	Production.	Exports.	Consumption.
1890.	3,135,911	18,395	3,117,516	1906.	11,486,647	1,035,705	10,450,942
1891.	4,114,385	18,986	4,095,399	1907.	11,731,044	945,035	10,786,009
1892.	4,719,524	21,387	4,698,137	1908.	10,662,972	593,819	10,069,153
1893.	5,095,945	27,451	5,068,494	1909.	13,916,053	686,687	13,229,366
1894.	5,681,801	38,920	5,642,881	1910.	12,704,902	960,295	11,744,607
1895.	5,841,403	53,012	5,788,391	1911.	13,437,778	1,200,957	12,236,821
1896.	4,719,860	95,638	4,624,222	1912.	14,659,700	1,530,353	13,129,347
1897.	8,997,245	129,767	8,867,478	1913.	13,559,727	977,477	12,582,250
1898.	7,418,475	307,190	7,111,285	1914.	13,132,814	809,167	12,323,647
1899.	7,618,130	750,781	6,867,349	1915.	14,583,026	2,051,475	12,531,551
1900.	7,233,979	613,858	6,620,121	1916.	17,147,665	3,363,876	13,783,789
1901.	9,803,822	420,506	9,383,316	1917.	17,040,666	2,574,054	14,466,612
1902.	10,982,246	595,391	10,386,855	1918.	12,279,800	1,763,460	10,516,340
1903.	9,631,661	704,546	8,927,115	1919.	13,094,221	2,011,045	11,083,176
1904.	11,926,661	734,554	11,192,107	1920.	16,449,506	2,087,195	14,362,311
1905.	10,854,892	799,734	10,055,158	.....	.....	.....	.....

The production of nail plate in 1920 was 20,577 gross tons, against 12,832 tons in 1919. The production of cut nails last year was 844,583 kegs of 100 lb., of which 86,427 kegs was exported, making the home consumption 758,156 kegs. With some fluctuations there has been a steady decline in the use of cut nails, the production in the 30-year period hav-

ing been at high point in 1890 at 5,640,946 tons. Of the country's total output of 1,377,566 tons of rolled forms of iron in 1920, Pennsylvania turned out 621,097 tons, or about 45 per cent. Ohio produced 129,201 tons, Indiana 217,366 tons, Illinois 111,056 tons and New York 62,184 tons.

PRODUCTION OF MISCELLANEOUS ROLLED PRODUCTS, GROSS TONS, 1916-1920.

Products.	1916.	1917.	1918.	1919.	1920.
Hoops	368,164	347,186	262,281	233,336	333,440
Bands and cotton-ties	562,555	490,893	250,767	352,172	388,862
Long angle splice bars, fish-plate bars, tie-plate bars, etc	691,820	606,824	416,905	434,008	575,830
Rolled sheet piling	19,196	18,606	11,689	17,811	20,716
Railroad ties	34,311	9,103	6,438	16,645	26,310
Rolled forging blooms and forging billets	2,015,960	1,801,708	1,659,113	359,582	447,334
Blooms, billets, sheet bars, tinplate bars, etc., for export	512,483	1,158,427	832,746	92,143	136,457
Spike and chain rods, bolt and nut rods, horseshoe bars, strips, shafting, tires, etc	1,669,228	1,797,802	1,793,734	1,487,423	2,089,912
Total	5,873,717	6,230,549	5,233,678	2,993,120	4,018,861

PRODUCTION OF RAIL JOINTS AND FASTENINGS, SHOWING IRON AND STEEL SEPARATELY, 1919-1920.

Articles.	1919—Gross tons.			1920—Gross tons.		
	Iron.	Steel.	Total.	Iron.	Steel.	Total.
Angle splice bars	1,944	109,225	111,169	2,347	172,931	175,278
Tie plates	51,314	153,896	205,210	47,512	216,123	263,635
Fish plates	427	11,423	11,850	676	15,927	16,603
Other rail joints	192	49,662	49,854	....	71,236	71,236
Total	53,877	324,206	378,083	50,535	476,217	526,752

It was necessary to estimate the output of one plant in 1919 and 1920. The output of spikes, bolts, nuts, and similar fastenings is not included. There were 25 active works in 1920 and 1919.

DEFLATION IN STEEL

Discussed by John A. Topping—Revival Waits on General Deflation in Labor, Etc.

The steel trade situation was discussed in the *New York Tribune* of June 26 by John A. Topping, chairman Republic Iron & Steel Co. Briefly recounting the conditions surrounding demand, production and prices during and since the war period, he then analyzed prospects as follows:

The public is still on a strike, notwithstanding the fact that values of iron and steel are down over 35 per cent (from the levels of 1920) and warehouse stocks of iron and steel are depleted. Fabricated products of iron and steel, apparently, are not entirely liquidated, but the process is not far from completion. The farm machinery makers, one of the largest consumers of iron and steel, are in this list of partial liquidation; their factories, generally, are idle, and doubtless will remain so, until their machinery stocks are liquidated. The railroads, on the other hand, are low in stocks. As an evidence of this, it is stated that out of 400,000 idle cars over 300,000 of these cars are out of repair, not because of high-priced steel, but waiting for cheaper labor.

Generally speaking, stocks of iron and steel are below normal and prices for such principal products as bars, plates and structural steel, are approximately down to the level of January, 1913. Of all trades, the steel industry leads the procession in deflation and general readjustment of values, both as to prices and wages; this is particularly true of the producers of steel, known as the "independents" (that is, steel makers other than the United States Steel Corporation).

The Deflation in Prices

Steel prices, for such principal products as bars, plates and structural shapes, which formerly sold at from 3½c. to 10c. per lb., have been reduced to from 1.90c. to 2.20c., or an average reduction of over 50 per cent; labor reductions range from 32 per cent to 40 per cent below war rates. But few industries can show this progress. Compared with these readjustments, nothing worth mentioning has taken place in transportation and the building trade, and no change whatever in coal mining costs, and yet, an academic demand exists for lower steel prices in certain Editorial Sections.

If such authority as THE IRON AGE is consulted, these advocates of lower prices will find that steel prices for such products as bars, plates and structural shapes, in January, 1913, sold at about $40 per ton. These same products can now be purchased at about $42 per ton, or within 5 per cent of the 1913 price.

As the year 1913 was one of fair prosperity, with steel selling at not far from present prices, it cannot be fairly charged that present steel prices are a bar to prosperity. What's the matter with business is not explained by high prices for steel but is explained by high rates for labor, fuel, transportation, taxes, and interest rates. Notwithstanding reductions in steel wages, present rates are about 90 per cent above those of 1913; on the other hand, labor rates in the building trade and transportation are up 135 per cent in many localities and more in others.

Answer to the Lack of Demand

The practical answer to the present lack of demand is, reduce the cost of general production, liquidate labor and thereby the general cost of living. Unless this is done, who will take the chance of building or constructive enterprise until assured against shrinkage in cost, excess taxation and high rates for money. Cheaper steel, only one item of cost, will not stimulate building—this can only be brought about by the combined influence of reasonable prices for steel, labor, freight rates and money.

This survey shows that further time will be required to complete our readjustments, but substantial progress has been made and in some lines of business, particularly textiles, decided improvement has taken place, with business close to normal. The iron and steel business, however, will not reach normal demand or volume until constructive enterprises can be safely inaugurated on a sound basis for cost, for it must not be forgotten that in both production and construction, labor is the essential factor, because in an ultimate sense it is 85 per cent of the total cost.

Gradual Improvement Near at Hand

The present active capacity of iron and steel to-day, is not far from 25 per cent but production is believed to be at the irreducible minimum. Never before, in the history of the iron and steel trade, has production fallen so low or remained so long at the minimum. In previous depressions, our low mark for a period has ranged around the 50 per cent mark. It is therefore confidently believed that gradual improvement is near at hand, and that reasonable expectations suggest a substantial increase in volume of business by early fall or late summer months, because cars must be repaired for the fall movement of grain and coal. The machinery makers will require some building for the next harvest, and iron and steel merchants must soon re-stock their stores to meet the repair requirements. Then it must not be forgotten that building is, and has been, below the demand in many directions, and necessity must be met so that demand is accumulating, while readjustments are under way. Labor, however, holds the key to prosperity to a large extent and progress towards normal will be rapid or slow, as labor may determine.

In other words, general deflation is clearly the cause of present ills, and therefore, the obvious remedy is, more general deflation. Deflation in steel alone will accomplish nothing. Deflation must be general, to bring about a normal equilibrium of values. Until this is accomplished, business activity will be deferred. On the other hand, with full co-operation by all interests, an early return to prosperity should result because of our stored-up wealth and potential strength.

GERMAN PRICES FIRMER

Slight Improvement Reported—Railroad Buying Active—Prices for Export Decline

(Special Correspondence)

BERLIN, GERMANY, June 6.—The abolishment of official maximum prices and export control as well as the dropping of the 3 per cent export levy by the Government have had a stimulating effect on the market, prices having become more stable during the past fortnight. Although business in rolled material is still a long way from being satisfactory, the works are feeling easier now that deals can be closed without governmental meddling and price control. Another contributing factor is the economic disturbance in Upper Silesia which has caused many customers to transfer business to the western market.

Foreign orders and contracts have been on a somewhat larger scale during the past weeks though there can be but little doubt that the sanctions of the Entente have been responsible for the loss of a considerable volume of business that might otherwise have gone to German mills. The latter are finding it increasingly difficult to convince neutral customers of their ability to deliver at contract terms despite the impediments of the Allies. Thus, a recent order for 6000 tons of rails for the Danish railroads, which German producers were sure to enter on their books, went to Belgium as did an order for 4800 tons of rails which the Finnish Government placed with French mills.

Activity in Railroad Material

In finished iron and steel, the keen demand for railroad material by foreign buyers deserves mention. Requirements of the German State Railroads are quite normal with prices fixed up to the end of June. We quote heavy steel rails at 2200 m. ($29.70) for domestic delivery, and rails for mines, including fishplates, at 1800 to 1850 m. ($24.48 to $25.16). Conditions in the sheet market can hardly be considered satisfactory. Some foreign orders have been secured but the industry as a whole has been working short time. We quote per metric ton f.o.b. maker's mill as follows: Heavy sheets, 1800 to 1850 m. ($24.48 to $25.16); medium sheets, 1900 m. ($25.84); chequered plates, 1900 m. ($25.84); light plates, 2000 m. ($27.20); dynamo sheets, 4500 m. ($61.20) and up.

Foreign Buying Improves Wire Market

The wire market is in a deplorable condition but a turn for the better has been noticeable during the last few weeks. The heavy stocks still carried by the larger mills are proving a drug on the market and there seems to be utter confusion regarding prices, but several large orders for prompt delivery have recently been placed by foreign buyers and the abolishment of price control and export supervision have reacted favorably. Makers state, however, that orders can be secured only at a sacrifice and confidential information leaves no doubt that the majority of export orders are booked at prices below the inland level. In a recent instance, deals in wire rods were closed with foreign interests at 1600 m. per ton for the express purpose of eliminating French and Belgian competition. The present price for domestic delivery is 1650 m. per ton, f.o.b. maker's mill, while 1700 m. may be had for quick deliveries.

Quotations on finished material follow:

	Marks per Metric Ton	
Beams, joists, etc., open hearth..	1800	$24.48
Structural shapes	1750	23.80
Rounds	1850	25.06
Bolt and nut iron.....	2150	29.24
Bar iron	1750–1800	23.80–$24.48
	Marks per Meter	Cents per Ft.
Boiler tubes, acc. to size.....	15–17	6.1–7.0
Seamless steel tubing, 1⅝ in....	17	7.0
Galvanized pipes, ½ in.....	6.80	2.8
Gas pipes, 1¼ in., acc. to quality	12.20–15.50	5.0–6.4

Prices for Export per Metric Ton at Beginning of June and End of April

	Holland Fl.		Switzerland Fr.		Norway Kr.		Overseas $	
	June-	April	June-	April	June-	April	June-	April
Bar iron.....	78	90	160	185	180	197	27	32
Heavy sheets..	82	110	170	220	185	235	28	38
Medium sheets	89	115	179	230	195	250	29	40
Light plates..	93	120	188	240	205	260	31	42
Wire, rolled...	78	...	...	185	...	197	..	32
Wire, drawn, per 100 kg..	9	11.15	200	215	205	230	£9	(10)

JAPANESE MARKET ACTIVE

Some Buying in Germany—Japanese Iron Offered at $30 Pacific Coast—Belgian Offers at New York

NEW YORK, June 28.—Evidently Japan, the first country to feel the worldwide business depression, is to be one of the first to recover, according to a prominent exporter. Fairly numerous inquiries and some buying continue from this source. In addition to the several bridges recently purchased for erection near Tokio, there is another bridge inquiry in the market for about 1500 tons of material. In the former inquiry, it is reported that one quotation as low as $61 per ton, c.i.f. Japan, was received by an exporter from a mill. The order for more than a mile of 48-in., 50-in., and 54-in. steel pipe for a hydroelectric project in Formosa probably will not be awarded until August or later.

Japanese sellers are now in a position to offer Chinese foundry iron at $30 per ton, c.i.f. Pacific Coast ports of the United States. Han Yen pig iron of high quality is selling in Japan at 65 yen per ton ($31.20), while the output of the Tata Iron & Steel Works, India, is bringing about 60 yen per ton ($28.80) in Japan and Japanese iron is rather generally quoted at 50 yen per ton ($24).

Japan Buys in Germany

A fair amount of business is being placed by Japanese consumers in Germany, particularly in nails, wire, tin plate, bars and shapes. German prices are low and the government is paying the 50 per cent export tax demanded by the Allies. It is believed, however, in Japan that the Japanese government may soon take steps to erect restrictions against wholesale importation of German material by the establishment of a special duty of 25 per cent or more. Unless German quotations could absorb this additional burden, the effect would probably be to turn more trade to the United States. Such an arrangement as this would not affect Belgian material and as an example of Belgian quotations to the Far Eastern markets, Belgian bars are being put down in Japan for about $44 per ton.

Belgian Prices Interest American Buyers

Consumers and dealers in New York are showing some interest in Belgian quotations, but with the American market in its present condition, there is little more than a mild interest, although Belgian sellers seem anxious to sell here at any price. Bessemer bars have been offered at 1.92c. per lb. put down in New York and open-hearth bars at 2.05c. per lb. Plate quotations of $53 per metric ton, c.i.f. New York (2.40c per lb), duty unpaid, have been received.

Among foreign buyers and representatives of foreign manufacturers in New York, is an agent from a Rumanian plant, who has been negotiating with exporters for the purchase of various materials including about 50 tons of No. 35 gage galvanized sheets, a tonnage of pure zinc sheets, about 50 tons of copper circles and 50 gross tons of tin plate. This material, which is the periodical requirement of a large manufacturing plant in Rumania, has until recently been purchased in Great Britain and European markets. Present difficulties in obtaining shipments from Great Britain led this company to investigate the market in the United States for their entire requirements, provided the European prices can be met.

Among recent orders reported to have been placed by Chinese railroads is the purchase by the Shantung Railroad, China, of 1107 Janney-Penn couplers, manufactured by the McConley Torley Co., Pittsburgh, and 400 Westinghouse airbrakes.

Iron and Steel Markets

SOME RAILROAD BUYING

Lower Prices on Steel for Car Repairs

Wages and Rolled Products Tend Downward—More Shutdowns After July 1

Reports have persisted that announcements of fresh reductions in steel prices would be made on July 1 by the Steel Corporation, but there are no indications of such a formal step. Actual market developments further confirm what was in evidence last week, that both the Steel Corporation and leading independent makers are meeting competition as it appears. This process is causing a gradual settling of prices.

The most encouraging indications are the activity of the administration at Washington in hastening the payment of the Government's debts to the railroads, the prospect that railroad bonds will be accepted by the Government on its counterclaims, and the placing of a fair amount of steel for the repair of cars, with the prospect that considerably more will follow shortly.

The scale of mill operations is little changed, being from 15 to 25 per cent for a number of independent companies and about 30 per cent for the Steel Corporation. There is agreement in the expressions coming from several steel making centers, that the falling away in demand is entirely without parallel and that the extent of unemployment is greater than leaders in the trade had believed possible.

Idle capacity will be increased on July 1, when such sheet and tin plate mills as work under agreement with the Amalgamated Association will close down. The conference with the union at Columbus, Ohio, on July 5 will start with the two sides far apart on the wage scale.

In general, wage adjustments in the industry tend to keep step with the changes in iron and steel prices, with indications of a downward course for both in the next few months.

The iron and steel duties in the new tariff bill are a surprise to the trade in their close approach to the then fully protective schedules of the Payne-Aldrich act of 1909. Some of the new provisions, particularly on ferroalloys, will cause sharp divisions in the industry.

Selling of steel by manufacturing consumers continues. This steel and that which is coming from jobbers' warehouses is so far equal to supplying current demand that orders actually going to mills represent no more than 20 per cent of capacity. In some cases mills have filled orders from their own warehouses at mill prices rather than start a mill for a meager rolling.

Plates have been under special pressure in the Chicago district, the steel for the 50 Sinclair Oil Co. tanks, variously put at 4000 to 7000 tons, going at 1.85c., Chicago, while some other work brought out 2c., Chicago. Low prices were made on several lots of steel for car repair work.

For the repair of 1325 Illinois Central cars 3500 tons of steel was bought. Another road's repair program calls for 6000 tons, and between the Erie and the Monon repairs for 3000 cars have been awarded or are pending. Increased activity in such work is looked for after July 1.

The letting of several large structural jobs has been postponed and few new projects have appeared. The week's contracting in buildings and bridges probably did not exceed 5000 tons. An inquiry from a Lake shipyard for 1750 tons of plates and shapes is noteworthy following a year of inactivity in boat buying on the Lakes.

Reinforcing bars are weaker. Recently 1.80c. has become quite common and 1.75c. is now possible. A reduction in bolt and nut prices averages about 5 per cent, applying against unfilled as well as new orders.

Further recessions appear in pig iron. Northern foundry iron in the Chicago district has definitely dropped to $20 at furnace, while resale iron of both Southern and Northern origin has been sold there at 60c. to $1 below the furnace prices. The top price of No. 2 foundry iron in the Pittsburgh district, as established by small sales, is $21, Valley furnace. Basic, Bessemer and malleable irons are weak at the recent reduction of 50c. a ton. Buying of 12,000 to 15,000 tons by cast-iron pipe shops in the South is the feature of the week.

The low bid on 16,025 tons of cast-iron pipe for Detroit was $47.30, delivered, equivalent to $38.50, Birmingham, though recent quotations have been from $40 to $43, Birmingham.

Continental prices, unless viewed in the light of the world stagnation, seem ominous. Belgian steel bars have been offered delivered in New York at 1.92c. per lb. In England, Belgian pig iron is available at £5 c.i.f., against British iron at £5 19s. and higher. Continental sheet bars are arriving in Great Britain at £7 10s., with Welsh bars quoted at £10 10s., following a reduction of £1 this week. A further reduction in British finished steel prices ranges generally between 10s. and 20s. a ton.

Pittsburgh

PITTSBURGH, June 28.

It is the common assertion in the iron and steel trade here that present conditions find no parallel in the history of the industry. Never before in the memory of those now active has business been so nearly at a standstill as is the case to-day, and the theory that there always are buyers at a price has been exploded by the fact that price cutting has failed utterly to revive the interest of buyers. Instead of enlarged plant activities, as might have been expected, from the increased tendency on part of producers in the past few weeks to make prices attractive to buyers, mill and furnace operations have further declined in the past week.

Idle capacity is likely to be further increased as of July 1, when a number of sheet and tin plate mills, working under an agreement with the Amalgamated Association of Iron, Steel and Tin Workers, will suspend, at least until a settlement is reached on a new wage scale for the year ending June 30, 1922. A conference is scheduled in Columbus, Ohio, on July 5, between representatives of the Amalgamated Association and the sheet and tin plate manufacturers. It is said that the latter are seeking a reduction in the wage

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	June 28, 1921	June 21, 1921	May 31, 1921	June 29, 1920
No. 2X, Philadelphia‡	$25.50	$25.50	$25.50	$47.15
No. 2, Valley furnace†	*21.00*	21.50	23.00	45.00
No. 2 Southern, Cin'ti†	*26.00*	26.50	26.50	45.60
No. 2, Birmingham, Ala.†	*21.50*	22.00	22.00	42.00
No. 2 foundry, Chicago*	*20.00*	20.50	22.00	45.00
Basic, del'd, eastern Pa	25.00	25.00	25.00	44.80
Basic, Valley furnace	20.50	20.50	21.75	45.00
Bessemer, Pittsburgh	24.46	24.46	25.96	46.40
Malleable, Chicago*	*20.00*	20.50	22.00	43.50
Malleable, Valley	22.50	22.50	24.00	45.00
Gray forge, Pittsburgh	*21.96*	22.96	23.96	44.40
L. S. charcoal, Chicago	37.50	37.50	37.50	57.50
Ferromanganese, del'd	70.00	70.00	80.00	....
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	$45.00	$45.00	$45.00	$55.00
O.-h. rails, heavy, at mill	47.00	47.00	47.00	57.00
Bess. billets, Pittsburgh	37.00	37.00	37.00	60.00
O.-h. billets, Pittsburgh	37.00	37.00	37.00	65.00
O.-h. sheet bars, P'gh	39.00	39.00	39.00	75.00
Forging billets, base, P'gh	42.00	42.00	42.00	85.00
O.-h. billets, Phila	42.74	42.74	42.74	64.10
Wire rods, Pittsburgh	48.00	48.00	48.00	75.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh., lb	2.20	2.20	2.20	2.75
Skelp, sh. steel, P'gh, lb	2.20	2.20	2.20	3.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.25	2.25	2.25	4.50
Iron bars, Chicago	*2.15*	2.20	2.25	3.75
Steel bars, Pittsburgh	2.00	2.00	2.10	3.50
Steel bars, New York	2.38	2.38	2.48	4.02
Tank plates, Pittsburgh	1.90	1.90	2.20	3.50
Tank plates, New York	2.28	2.28	2.58	3.77
Beams, etc., Pittsburgh	2.00	2.00	2.20	3.10
Beams, etc., New York	2.38	2.38	2.58	3.27
Steel hoops, Pittsburgh	2.50	2.50	2.75	5.50

Sheets, Nails and Wire,	June 28, 1921	June 21, 1921	May 31, 1921	June 29, 1920
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh.	3.75	3.75	4.00	5.50
Sheets, galv., No. 28, P'gh.	4.75	4.75	5.00	7.00
Sheets, blue an'l'd, 9 & 10	2.85	2.85	3.10	4.50
Wire nails, Pittsburgh	3.00	3.00	3.00	4.00
Plain wire, P'gh	2.75	2.75	3.00	3.50
Barbed wire, galv., P'gh	*3.65*	3.85	4.10	4.45
Tin plate, 100-lb. box, P'gh.	$6.25	$6.25	$6.25	$7.00
Old Material, Per Gross Ton:				
Carwheels, Chicago	$13.25	$13.25	$14.00	$35.50
Carwheels, Philadelphia	18.00	18.00	18.00	38.00
Heavy steel scrap, P'gh	*12.00*	12.75	13.50	25.50
Heavy steel scrap, Phila	11.00	11.00	12.00	22.50
Heavy steel scrap, Ch'go	*10.25*	10.50	11.50	23.50
No. 1 cast, Pittsburgh	*16.00*	16.50	18.00	40.00
No. 1 cast, Philadelphia	17.50	17.50	18.00	37.00
No. 1 cast, Ch'go (net ton)	12.50	12.50	13.50	36.00
No. 1 RR. wrot. Phila	14.00	14.00	15.00	33.00
No. 1 RR. wrot. Ch'go (net)	9.50	9.50	10.50	24.50
Coke, Connellsville,				
Pet Net Ton at Oven:				
Furnace coke, prompt	*$3.00*	$2.75	$3 25	$17.00
Furnace coke, future	3.25	3.25	3.40	11.50
Foundry coke, prompt	*4.25*	4.50	4.50	17.00
Foundry coke, future	4.75	4.75	5.00	16.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	*12.62½*	12.75	13.25	19.00
Electrolytic copper, N. Y.	*12.62½*	12.75	13.25	19.00
Zinc, St. Louis	*4.25*	4.45	4.75	7.55
Zinc, New York	*4.75*	4.95	5.25	7.90
Lead, St. Louis	*4.15*	4.20	4.70	8.00
Lead, New York	4.40	4.40	5.00	8.25
Tin, New York	*29.00*	28.75	31.50	48.50
Antimony (Asiatic), N. Y.	*4.87½*	5.12¼	5.25	7.50

*The average switching charge for delivery to foundries in the Chicago district is 70c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

scales, while the union wants present schedules reaffirmed, and the fear is expressed that an agreement may not be readily had.

It is doubtful if more than 25 per cent of the sheet and tin plate mills of the country are running to-day and in view of the fact that mill stocks of sheets and tin plate are of rather substantial proportions, the manufacturers are in an excellent position to dictate terms to the Amalgamated association. It is possible, indeed, that an effort will be made to re-establish the open shop in the sheet and tin plate mills.

Mills rolling the heavier products, such as plates, shapes and bars, have not been so poorly engaged in a long time as they are now. All of the independent plate mills in the Youngstown district are idle. Of the 138 blast furnaces (merchant and steel works) in the Pittsburgh, Wheeling, Johnstown and Valley districts, only 28 to-day are in blast and the total will be reduced by one on Thursday, when the second furnace of the McKinney Steel Co., Josephine, Pa., will be blown out. Open hearth furnace operations in these districts do not exceed 30 per cent of capacity.

There is much speculation as to the next step of the Steel Corporation in regard to prices. In view of the fact that the American Sheet & Tin Plate Co. met the revised prices of several independent manufacturers there is a belief that the corporation may abandon a policy of naming a regular schedule and will merely meet competition. It is doubted that the corporation will become a participant in severe price cutting, but rather would meet prices which had become fairly general among independents. There are reports that the corporation already is meeting independent prices on bars, plates and shapes, but such reports find no confirmation. There is little doubt that the corporation recognizes the necessity of getting down to lower levels, but the best opinion is that it will continue to step, rather than to jump, down.

Labor seems to be steadily liquidating itself and there is so much unemployment in this and the nearby districts that employers outside of the steel industry are finding it comparatively easy to secure help at low rates. Further wage reductions are probable before long and probably will be made without serious trouble.

Pig Iron.—So little has been going on in this market in the past week that it is impossible to make more than an appraisal of prices. It has been definitely established by small sales that $21 is about top on No. 2 foundry iron from Valley furnaces. Both inquiries and sales are lacking in the other grades and prices that could be obtained are extremely indefinite. Generally merchant producers are holding at $20.50, Valley furnace, for basic, and $22.50 for Bessemer and malleable. It is intimated, however, that it would be dangerous for consumers who did not want the iron to make offers within $1 a ton of those prices.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.96 per gross ton:

Basic	$20.50
Bessemer	22.50
Gray forge	20.00
No. 2 foundry	21.00
No. 3 foundry	20.50
Malleable	22.50

Ferroalloys.—The market is absolutely flat and prices nominal. Producers, in all cases, are more anxious for business than consumers are for supplies and consequently an inquiry, no matter how small, occasions sharp competition. The result is that prices of all materials are entirely in buyers' favor. We note a sale of a carload of 50 per cent domestic ferrosilicon at $69, furnace, freight allowed, to a Pittsburgh district consumer. Canadian material, packed in barrels, is available at the same price, and recent efforts by some of the domestic makers to obtain more have been unsuccessful. The market on 76 to 80 per cent ferromanganese appears to have settled to $70, delivered,

for domestic material and to $70 c.i.f. Atlantic seaboard, for the English product.

We quote 76 to 80 per cent ferromanganese at $70 delivered on domestic; English, 76 to 80 per cent, $70, c.i.f. Atlantic seaboard. We quote average 20 per cent spiegeleisen at $27 to $28 furnace quoted by makers on direct business and $25 to $26 furnace on resale tonnages; 50 per cent ferrosilicon, $69 furnace, freight allowed, for domestic and foreign material. Bessemer ferrosilicon is quoted f.o.b. Jackson County and New Straitsville, Ohio, furnaces, as follows: 9 per cent, $41.50; 10 per cent, $45; 11 per cent, $48.50; 12 per cent, $51.60. Silvery iron, 6 per cent, $32; 7 per cent $33.50; 8 per cent, $35.50; 9 per cent, $37.50; 10 per cent, $40; 11 per cent, $43.30; 12 per cent, $46.60. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is $4.06 per gross ton.

Billets, Sheet Bars and Slabs.—It is reported that some sheet bar makers, either for financial reasons or to round out a rolling schedule, have taken some business at as low as $35, delivered. Figuring an average for freight of $2 per ton from producing to consuming point, this price would figure back to $33, Pittsburgh.

We quote 4 x 4-in. soft Bessemer and open-hearth billets at $37; 2 x 2-in. billets, $39; Bessemer and open-hearth sheet bars, $39; slabs, $38; forging billets, ordinary carbons, $42, all f.o.b. Youngstown or Pittsburgh mills.

Wire Rods.—Prices are unchanged on a base of $48, Pittsburgh, for No. 5 common soft rods, but this fact is not evidence of strength, but rather of a lack of inquiries which would provide a test. Rods at their present prices admittedly are out of line with the finished products and a decline undoubtedly would come with the appearance of a sufficiently attractive inquiry. Prices are given on page 1792.

Plates.—A number of inquiries, chiefly from fabricating interests, are before makers, but they generally carry a bid of 1.85c., which is somewhat below where makers are willing to go at present. As low as 1.90c., however, has been done, and Chicago mills have quoted 2c., Chicago, against recent inquiries. We quote sheared plates ¼ in. and heavier of tank quality at 1.90c. to 2.20c., Pittsburgh.

Structural Material.—Structural awards still are few in number and small in tonnage. The McClintic-Marshall Co. has taken 220 tons for a piershed at San Juan, Porto Rico, 100 tons of deck plate girders for the Atlantic Fruit Co., 100 tons for steel floors for three bridges at Chicago, for the New York Central Railroad, 425 tons for roof supports for the Liberty tunnels, Pittsburgh, and 210 tons for a crane runway for the Bessemer Gas Engine Co., Grove City, Pa. Bids will be opened June 30 for 1000 tons of structural steel for a bridge at Bethlehem. One large shop in this district is running four to five days a week, mainly on small jobs, but the average of operations in this district is not much in excess of 25 per cent of capacity. Structural beams still are quoted by most makers at 2.20c., but it is said that 2c. or less would be developed by the appearance of a really attractive order. Plain material prices are given on page 1792.

Wire Products.—Discounts on woven wire fence have been advanced so that price is lowered 5 per cent, the new base for carload lots to dealers being 65½ per cent off list. On these lines sold through jobbers an additional discount of 2½ per cent is allowed.

We quote wire nails at $3 base per keg, Pittsburgh, and bright basic and Bessemer wire at $2.75 base per 100 lb. Pittsburgh.

Steel Rails.—Some makers of light rails, rolling them from new steel, still are quoting the stabilized base of 2.20c. Pittsburgh, but are getting no business, because so many rails are available from mills making them from old rails or shell steel at 2c. or less. It is reported that one of the mills making light rails from old standard sections has made sales in the east as low as $40 per gross ton, or about 1.80c. per lb.

We quote 25 to 45-lb. sections, rolled from new steel, 2.10c. to 2.20c.; rolled from o'd rails, 1.80c. to 2c.; standard rails, $45 mill for Bessemer, and $47 for open-hearth sections.

Nuts, Bolts and Rivets.—No improvement can be chronicled in business, buyers still adhering strictly to a hand-to-mouth policy in purchases. Changes in prices are found on page 1792. Sales of large structural rivets recently have been done at 2.90c. and there are unconfirmed reports that some business has been booked as low as 2.75c.

Spikes.—The market is dull and weak. The April 13 base of $3.40 on large spikes has entirely disappeared and they are not quotable at higher than $3.25. Some makers still are holding the smaller sizes at $3.40 base, but even these sizes now are available at $3.25. Jobbers serving the coal mines are making fair sized purchases of small spikes, but standard railroad spikes still are neglected. Prices are given on page 1792.

Iron and Steel Bars.—There is an utter dearth of inquiries for steel bars, and therefore little upon which to base prices. Some makers still are quoting 2.10c., base, Pittsburgh, but others have offered tonnages at 2c. and even have gone as low as 1.95c. in an effort to stir up an order. Competition for passing orders for reinforcing bars is sharp. These bars, rolled from old rails or shell steel, have been offered as low as 1.85c., mill, and 2c., Pittsburgh, and measure the maximum price possibilities on such bars rolled from new steel. A large tonnage of reinforcing bars will be required for the new hill to hill bridge at Bethlehem, Pa., bids for which will be opened June 30, at the State Highway Department in Harrisburg. Makers of iron bars here still are holding at 2.65c. to 2.75c. for refined bars, but there is a possibility of a cut, following the bi-monthly puddling wage settlement.

We quote steel bars rolled from billets at 1.95c. to 2.10c.; reinforcing bars, rolled from billets, 1.95c. to 2.10c. base; reinforcing bars rolled from old rails, 1.85c. to 1.90c.; refined iron bars, 2.65c. to 2.75c., in carloads, f.o.b. mill, Pittsburgh.

Cold-Finished Steel Bars.—An Eastern maker has issued a card of quantity differentials which in carload lots call for an extra of 20c. per 100 lb. for lots of 1 ton or more of a size; of 40c. per 100 lb. for lots of less than a ton down to 1000 lb., and of 60c. per 100 lb. for lots of less than 1000 lb. The same extras are applied on less than carloads, but in the case of carload lots the extras are waived if the total specification is 18 tons or more, and on less than carload lots if the total specification is for 12,000 lb. or more. The card adopted by most manufacturers on Aug. 18, 1919, and which most of them still are observing, provided for an extra of 15c. per 100 lb. for lots of less than a ton down to 1000 lb., and of 35c. per 100 lb. for lots of less than 1000 lb.

Iron and Steel Pipe.—While the reports about the demand are a little more cheerful than those about other finished products, it would be exaggeration to describe the market as other than quiet. Such business as is developing is purely of a pick up character and the effort of the distributors is to lighten rather than add to their load. Prospects for immediate improvement in the demand for oil country goods is dimmed by another drop of 25c. per barrel in Pennsylvania crude oil, carrying it to $2.25 per barrel, or almost $4 per barrel below the peak price of last year. A number of oil producers have surplus supplies of tubular goods and these they are trying to work off at less than the manufacturers' prices. Lower prices are expected in all lines of pipe before long and some jobbers are said to be anticipating this both by shading quotations and in giving guarantees against a decline. Quotations given on page 1792 are to a large extent nominal.

Sheets.—Anxiety on the part of some of the independent mills to clean up as much production as possible before July 1, when they plan on an indefinite shut down, has brought out even lower prices, notably on galvanized sheets, than recently were established by a number of independent companies, and subsequently met by the American Sheet & Tin Plate Co. Galvanized sheets have been offered by at least two makers at 4.50c. base, or $5 a ton below the recently established figure, and, it is said, about $16 per ton below what producing costs are estimated to be on the present grade of operations. General business still is slow because consumers have fairly sizable stocks and for financial reasons are disposed to get rid of these supplies before taking on fresh ones. Prices are given on page 1792.

Tin Plate.—Fairly good demand still is coming from makers of containers for condensed milk and also for paint. Otherwise, business is extremely slack, and few

of the trade are anticipating any improvement during the next few months. The pack of pears promises to be fairly heavy, but probably will run light in other perishable foods. There was a considerable excess pack of corn and tomatoes last year and a corresponding cut in the pack of this year is planned. The price of production tin plate holds firmly at $6.25 per base box, and it is claimed that this price shows a loss on today's mill operation of about 25 per cent of capacity. Stock items continue to be offered anywhere from $5 to $5.75 per base box, but such material is not plentiful now as it was a short time ago, and $5.50 is the more common minimum.

Hoops and Bands.—Interest in the market remains at low ebb and willingness of some makers to take business at 2.50c. has practically blotted out the April 13 quotation of 2.75c.

Hot-Rolled and Cold-Rolled Strips.—The market has quite definitely settled to a base of 5c. for cold-rolled strips, and while some makers still are holding hot-rolled strips at 2.75c., 2.50c. to 2.60c. embraces the bulk of sales. Some companies have had a fair run of orders in the past week but the more common report is of dullness because of conditions in the automotive industry and the fact that hardware manufacturers are very sparing buyers.

Nuts, Bolts and Rivets.—A reduction in price averaging about 5 per cent has just been announced by makers of bolts and nuts, the new prices becoming effective immediately, and applying against unfilled as well as new orders. The new base is 60 and 10 per cent off list for the larger and longer sizes of machine bolts. Rivets also are weaker being quotable at 2.90c. to 3c. for large structural rivets and 3c. to 3.10c. on large boiler rivets. Small rivets now are quoted at 65, 10 and 10 per cent off list. Prices and discounts are given on page 1792.

Old Material.—Max Solomon, Pittsburgh, was recently awarded 15,000 tons of plate scrap, owned by the Government and lying at Leetsdale, Pa., at $12.50 per gross ton. The Pennsylvania Railroad, Eastern region, scrap list for July offers 21,455 net tons, bids against which must be in by 9 a. m., July 6.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate, as follows:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh	$12.00 to $12.50
No. 1 cast cupola size	16.00 to 16.50
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Parkersburg and Huntington, W. Va.; Franklin, Pa., and Pittsburgh	13.50 to 14.00
Compressed sheet steel	9.50 to 10.00
Bundled sheet sides and ends, f.o.b. consumers' mills, Pittsburgh dist.	8.00 to 8.25
Railroad knuckles and couplers	12.50 to 13.00
Railroad coil and leaf springs	12.50 to 13.00
Railroad grate bars	10.00 to 10.50
Low phosphorus melting stock, bloom and billet ends, heavy plates, ¼-in. and thicker	16.00 to 16.50
Railroad malleable	12.00 to 13.00
Iron car axles	18.00 to 19.00
Locomotive axles, steel	17.50 to 18.00
Steel car axles	14.50 to 15.00
Cast iron wheels	13.00 to 13.50
Rolled steel wheels	12.50 to 13.00
Machine shop turnings	7.00 to 7.50
Sheet bar crop ends at origin	12.00 to 12.50
Heavy steel axle turnings	8.50 to 9.00
Short shoveling turnings	8.00 to 8.50
Heavy breakable cast	14.00 to 14.50
Stove plate	12.00 to 12.50
Cast iron borings	8.00 to 8.50
No. 1 railroad wrought	12.00 to 12.50

Coke and Coal.—The coke market has stiffened slightly since last accounts, not that the demand has improved, but rather that a number of operators either have put out ovens or are planning to do so soon. While there were a few sales recently of spot tonnages of furnace coke at $2.75 per net ton, oven, it is doubtful if this price could be done again and it is noted that in the past few days brokers have paid $3 per net ton at oven, which would mean at least $3.15 to consumers. We note a sale of 3500 tons of standard coke for shipment during July, at $3.45 to the producer and $3.60 to the consumer, the business having been done through a middleman. A large producer of foundry coke has just announced a cut of 25c. per ton in his price to $4.25 per net ton at oven. As high as $5 still is being quoted by some producers against both spot and future shipments, but the more general maximum is $4.50 and that for selected 72-hr. fuel. Some business is doing in coal but at prices largely of the buyer's making. Mine run steam coal is quoted at $1.50 to $2.25 at mines; by-product coal at $1.75 to $2 and gas grades $2.25 to $2.50.

British Iron and Steel Market

Continental Prices Capture Orders—American Competition Felt—Situation Bad

(*By Cable*)

LONDON, ENGLAND, June 28.

Outlook for settlement of the coal strike is becoming more hopeful.

Pig iron is idle. Home consumers are awaiting reductions, which are unlikely to materialize unless producers are able to obtain cheaper fuel. Belgian pig iron is offered at £5 ($18.75) c.i.f. Official minimum quotations are unchanged, but sellers for July delivery are asking £6 15s. ($25.31). Hematite is stagnant, with prices unaltered.

Steel makers are continually losing orders because of their high prices. India has placed a large order of railway material in the United States. The Continent is securing many orders, including 10,000 tons of rails for Australia. Continental bars and angles are being sold at £7 15s. ($29.06) f.o.b.

Clyde shipyard men have accepted a reduction in wages.

Welsh sheet bars have been reduced 20s. ($3.75), but Continental material is arriving, priced at about £7 10s. ($28.13) against the Welsh figure of £10 10s. ($39.39). Sellers of tin plates for prompt delivery ask 27s. ($5.06) f.o.b.; for forward delivery, 25s. ($4.69) f.o.b.

Light specifications are becoming scarce. Export business generally is dull, but Japan has bought 75-lb. wasters at 17s. ($3.19) f.o.b. Galvanized sheet makers are endeavoring to form an association to regulate their selling prices. The minimum quotation now is £24 ($90.00) basis, f.o.b., but there is little inquiry.

We quote per gross ton except where otherwise stated, f.o.b. maker's works, with American equivalent figured at $3.75 per £1 as follows:

Durham coke	£2	2					$7.88	
Cleveland basic	6	0					22.50	
Cleveland No. 1 foundry	6	5					23.44	
Cleveland No. 3 foundry	6	0					22.50	
Cleveland No. 4 foundry	5	19					22.31	
Cleveland No. 4 forge	5	17½					22.03	
East Coast mixed	8	0	&	£7	5*		30.00 &	$27.19
Ferromanganese	18	0	&	15	0*		67.50 &	56.25
Ship plates	15	0	to	15	10		56.25 to	58.13
Boiler plates	19	0	to	21	0		71.25 to	78.75
Tees	15	0	to	15	10		56.25 to	58.13
Channels	14	5	to	14	15		53.44 to	55.31
Beams	14	0	to	14	10		52.50 to	54.38
Round bars, ¾ to 3 in.	14	0	to	14	10		52.50 to	54.38
Rails, 60 lb. and up	13	0	to	15	0		48.75 to	56.25
Billets	11	0	to	11	10		41.25 to	43.13
Sheet and tin plate bars, Welsh	10	10					39.39	
Galvanized sheets, 24 g.	24	0					90.00	
Black sheets	19	0	to	20	0		71.25 to	75.00
Tin plate base box	1	5	to	1	8		4.69 to	5.25
Steel hoops	17	0					63.75	

*Export price.

Prices Reduced in Sweden

STOCKHOLM, SWEDEN, June 6.—The Swedish Iron Federation has readjusted prices as shown in the following table. All prices are in Swedish kr. per metric ton, f.o.b. maker's mill. Prices are given in dollars at the rate of 4.305 kr. per dollar, and on gross tons f.o.b. Swedish port.

	June 1			April 30
Export pig iron	180–190	$41.80 to	$44.14	190–200
Billets, annealed	400–500	92.91 to	116.14	450–500
Wire rods	450–550	104.53 to	127.76	500–550
Open hearth bars	280–300	65.03 to	69.69	300
Lancashire iron	360		83.62	330

Chicago

CHICAGO, June 28.

The entire market is unsettled and it is difficult to ascertain a ruling price level for any commodity. For oil storage tanks 7000 tons of plates were bought at a reported price of less than 1.50c., Pittsburgh, but it cannot be said that this is the rule in the market quotation. The tonnage was large, the specifications were attractive and by booking the business the mill escaped a shutdown. Mild steel bars range from 1.85c., Pittsburgh, to 1.95c., and the minimum on bar iron has dropped to 2.15c., Chicago. Structural shapes are obtainable at 2c., Pittsburgh, or less, while sheets are on about the same level as a week ago, with galvanized and black weaker than blue annealed. More car repair work has been let and car builders look forward to considerably more business of this character after July 1. Northern foundry pig iron has definitely dropped to $20, base, furnace, and some resale material has been sold for even less.

Furnace and mill operations are little changed. The Illinois Steel Co. has blown out one furnace at Joliet, leaving 8 furnaces in blast out of the company's 29. Its steel output has increased slightly, being, however, at the rate of 30 per cent for the current week. The Inland Steel Co. continues to operate at 20 to 25 per cent of ingot capacity and the situation with other independents is substantially the same as a week ago, except for the fact that the Calumet mill at Chicago Heights, which was idle last week, resumed operation Monday.

Pig Iron.—Furnace quotations on Northern iron have again dropped 50c. a ton to $20, base furnace. This price applies on tonnage business, while carload lots are bringing 50c. to $1 more. About 1000 tons of Northern and Southern resale iron has been sold within the past week at 60c. to $1 below the going furnace prices. Of this amount 400 tons was non-malleable for delivery in Michigan, 300 tons was Southern foundry and 125 tons was malleable, while the remainder was made up of smaller sales. Demand continues light and this is not surprising, as it is doubtful whether foundry operations average more than 20 per cent. The leading Northern merchant interest, which showed an increase in shipments in March and June 1 is now just holding its own, having shipped about as much tonnage this month as in May. The St. Paul Railroad did not purchase pig iron as reported a week ago, but has issued a new inquiry which is substantially the same as the one in which quotations were received before. The inquiry calls for 400 tons of malleable, 0.75 to 1.25 per cent silicon, 300 tons of malleable, 1.25 to 1.75 per cent silicon, and 100 tons of foundry, 2.75 to 3.25 per cent silicon. It was erroneously stated in this paragraph a week ago that two additional local jobbing foundries had adopted the union shop. As a matter of fact, these foundries were formerly closed shops, and have now gone over to an open shop basis, there now being four companies which have taken this action, Holmes, Pyott & Co., the R. M. Eddy Foundry Co., the Greenlee Foundry Co. and the James A. Brady Foundry Co.

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$37.50
Northern coke, No. 1, sil. 2.25 to 2.75	$20.50 to 21.50
Northern coke foundry, No. 2, sil. 1.75 to 2.25	20.00 to 21.00
Northern high phos.	20.00 to 21.00
Southern foundry, sil. 1.75 to 2.25	27.67
Malleable, not over 2.25 sil.	20.00 to 21.00
Basic	20.00 to 21.00
Low phos., f.o.b. Birmingham, sil. 1 to 2 per cent copper free	31.00
Silvery, sil. 8 per cent	38.53

Ferroalloys.—There is no activity in the ferroalloys.

We quote 78 to 82 per cent ferromanganese, $78 delivered; 50 per cent ferrosilicon, $80 delivered; spiegeleisen, 18 to 22 per cent, $37 to $38 delivered.

Plates.—The Sinclair Consolidated Oil Co. has awarded 25 oil storage tanks to the Chicago Bridge & Iron Works and an equal number to the Graver Corporation. The plates, amounting to 7000 tons, were placed with a local mill at a reported price of 1.85c. Chicago. The exceedingly low price is accounted for by the size of the tonnage and the fact that the mill was on the verge of a shut down when it took the order. The Midwest Refining Co. is reported to have let seven oil storage tanks for Casper, Wyo., involving 1880 tons, to the Chicago Bridge & Iron Works. Railroad car repair work continues to develop with prospects of steadily increasing activity in this direction after July 1. The Illinois Central has let repairs on 600 steel gondola cars, requiring 3500 tons of steel, to the General American Car Co. The same car builder is low bidder on the rebuilding of 725 coal cars for the Chicago & Illinois Midland. The latter job will call for 6000 tons, largely plates. The Monon is asking for figures on the reconstruction of 1000 gondola cars. The Erie has awarded repairs on 500 steel hopper cars to the Greenville Steel Car Co., Greenville, Pa.

This road is still asking for figures on the repair of 1000 box and 500 hopper cars. There is little inquiry for plates except that for which the oil companies and the railroads are responsible. The market is so unsettled that there is no defined level of prices. The fact that one mill took a large tonnage at a very low price to prevent a shut down is hardly a sure indication of what would be quoted now.

The mill quotation is 2c. Pittsburgh, the freight to Chicago being 38c. per 100 lb. Jobbers quote 3.23c. for plates out of stock.

Structural Material.—Sharp competition continues the rule both among mills and fabricators. New structural work is slow in materializing. Locally the resumption of building has not released new projects and it is improbable that further contracts will be let until Federal Judge Landis settles all angles of the controversy between the contractors and the unions. Mill prices on plain material are soft and ill-defined. Fabricating bids on the First National Bank building, Fort Wayne, Ind., involving 1500 tons, have been rejected. Action on the Masonic Temple at Detroit, a structure calling for 7000 tons, has been postponed until September. Bids on the general contract for the Ohio State University stadium, requiring 4500 tons of structural steel and 3000 tons of reinforced bars, were taken last week. The low bid was $150,000 in excess of the amount of money pledged for the building, with the result that the plans must be modified before an award can be made. Recent lettings include:

Illinois Bell Telephone Co., Peoria, 385 tons, to Decatur Bridge Co.

School building, Hammond, Ind., 300 tons, to New City Iron Works.

Peninsular Power Co., 66 transmission line towers, Florence, Wis., 112 tons, to American Bridge Co.

Holm-Page Co., Wedron, Ill., sand handling plant, 75 tons, to Worden-Allen Co.

Inquiries include:

Mechanical repair shop, Motor Transport Division, Army, Fort Leavenworth, Kan., 111 tons.

Subway, Chicago, Burlington & Quincy, Aurora, Ill., tonnage not given.

The mill quotation is 2c., Pittsburgh, which takes a freight rate of 38c. per 100 lb. for Chicago delivery. Jobbers quote 3.23c. for materials out of warehouse.

Rails and Track Supplies—Except for a purchase of 1200 tons of iron tie plates by a Mid-western road, new orders for track accessories have been small and scattered. The Colorado mill is quoting f.o.b. plant at prices which do not permit mills further East to compete for business in that territory.

Standard Bessemer rails, $45; open-hearth rails, $47; light rails rolled from new steel, 2.20c. f.o.b. makers' mills.

Standard railroad spikes, 3.25c., Pittsburgh; track bolts with square nuts, 4.20c., Pittsburgh; steel tie plates, 2.50c., and steel angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 2.50c. f.o.b. makers' mills.

Bolts and Nuts.—The market remains very quiet but here and there a few buyers are placing contracts for moderate amounts. The Ford Motor Co. is expected to buy its next month's bolt requirements this week. In general prices quoted in this district are as follows:

Carriage bolts, ⅝ x 6 in. and smaller, rolled threads, 65 and 10 off. Cut threads, 60 and 10 off; larger and longer, 60 and 10 off to 60 and 5 off. Machine bolts, ⅝ x 4 in. and smaller, rolled threads, 70 and 7½ off. Cut threads, 65 and 10 off; larger, 65 and 10 off to 60 and 10 off. Machine bolts, cold punched, chamfered and trimmed, ⅝ x 4 in. and smaller, 60 and 5 off; larger, 60 off. Lag bolts, 65 and 10 off. Plow bolts, Nos. 1, 2 and 3 head, 60 and 5 off. Stove bolts in

packages, 80 and 10 off; in bulk, 80 and 10 and 2½ off. Rivets, 7/16 in. and smaller, 65 and 10 and 10 off. Hot pressed nuts, tapped, $3.75 to $4.25 off; blank, $4 to $4.60 off. Cold punched, chamfered and trimmed nuts, blank, $4.60 off; tapped, $4.25 off. Semi-finished hexagon nuts, 9/16 and smaller, U. S. Standard, 80 and 10 and 10 off; S. A. E. or A. L. A. M., 80 and 10 and 10 and 10 off; ⅝ and larger, U. S. Standard, S. A. E. or A. L. A. M., 70 and 10 and 10 and 10 off; all f.o.b. Pittsburgh.

The decline in bolts and nuts has been reflected in a second cut in warehouse prices.

Jobbers quote structural rivets 4.53c.; boiler rivets, 4.63c.; machine bolts up to ⅜ x 4 in., 60 per cent off; larger sizes, 55 off; carriage bolts up to ¾ x 6 in., 55 off; larger sizes, 50 and 5 off;; hot pressed nuts, square and hexagon tapped, $3 off;; blank nuts, $3.25 off; coach or lag screws, gimlet points, square heads, 60 per cent off. Quantity extras are unchanged.

Bars.—Outside of the car repairs referred to under plates and a moderate amount of reinforcing work, there are no bright spots in the bar market. Prices on mild steel bars are unsteady with most quotations ranging from 1.85c. Pittsburgh, to 1.95c. Bar iron prices vary from 2.15c., Chicago, to 2.25c. There has been no material change in prices of rail carbon steel bars.

Mill prices are: Mild steel bars, 1.85c. to 1.95c., Pittsburgh, taking a freight of 38c. per 100 lb.; common bar iron, 2.15c. to 2.25c. Chicago; rail carbon, 1.90c. to 2c., mill or Chicago.

Jobbers quote 3.13c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars is 4.63c. for rounds and 50c. extra for flats squares and hexagons. Jobbers quote hard and medium deformed steel bars at 2.48c. base.

Cast-iron Pipe.—The Lynchburg Foundry Co. is low bidder on 16,025 tons for the Detroit Water Department. The bid was $47.30, delivered, or $38.50, Birmingham. As the tonnage was large and the sizes attractive, this price hardly represents the ruling market level. On ordinary business from $40 to $45 Birmingham is being quoted. Recent awards include:

Springfield, Ill., 80 tons, to National Cast Iron Pipe Co.

Manitowoc, Wis., 60 tons, to United States Cast Iron Pipe & Foundry Co.

Pending business includes:

Board of Fire Commissioners, Detroit, 100 tons, United States Cast Iron Pipe & Foundry Co., low bidder.

Fort Wayne, Ind., 470 tons, bids to be taken June 29.

Spring Wells, Mich., 600 tons, June 28.

Minneapolis, 200 tons, June 29.

Columbus, Ohio, 250 tons, June 28.

We quote per net ton f.o.b. Chicago, ex-war tax as follows: Water pipe, 4-in., $52.10 to $57.10; 6-in. and above, $49.10 to $54.10; class A and gas pipe, $3 extra.

Sheets.—Although bookings remain light, they compare favorably with those in plates, shapes and bars. One local producer continues to operate at about one-half of capacity. The prices given below present the ruling market, but even lower quotations are being named, from 4.50c. to 4.65c., base Pittsburgh, having been done on galvanized, and 3.60c. and 3.70c., base Pittsburgh, on black.

Mill quotations are 3.75c. for No. 28 black; 2.85c. to 3.10c. for No. 10 blue annealed and 4.75c. for No. 28 galvanized, these all being Pittsburgh prices, subject to a freight to Chicago of 38c. per 100 lb.

Jobbers quote: Chicago delivery out of stocks, No. 10 blue annealed, 3.88c.; No. 28 black, 5.15c.; No. 28 galvanized, 6.15c.

Wire Products.—Buying has fallen off during the past week. Whether this is a temporary lull or portends inactivity throughout the summer is as yet uncertain. If the railroads undertake extensive repair work next month, as is expected in some quarters, they will account for considerable nail business. Local warehouse quotations on cement coated nails have been reduced to $3.05 a keg. For mill prices see finished iron and steel, f.o.b. Pittsburgh, page 1792.

We quote warehouse prices, f.o.b. Chicago: No. 9 and heavier black annealed wire, $3.63 per 100 lb.; No. 9 and heavier bright basic wire, $3.78 per 100 lb.; common wire nails, $3.73 per 100 lb.; cement coated nails, $3.05 per keg.

Railroad Rolling Stock.—The Monon, which has been in the market for repairs on 1000 gondola cars, has let 100 underframes and 100 gondola superstructures to the Haskell & Barker Car Co. Other car repair orders and inquiries are mentioned in the plate paragraph.

Old Material.—There is little buying by users but further weakness in the market has been indicated by such transactions as have taken place. The Steel & Tube Co. of America bought 500 tons of heavy melting at $10.50, delivered. Going prices on many grades quoted below have dropped from 25c. to 50c. a ton. There are few railroad lists. The Pennsylvania Central Region offers 13,000 tons while the New York Central and the Erie are advertising blind lists.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$15.50 to $16.00
Relaying rails	30.00 to 32.00
Car wheels	13.25 to 13.75
Steel rails, rerolling	12.50 to 13.00
Steel rails, less than 3 ft.	11.50 to 12.00
Heavy melting steel	10.25 to 10.75
Frogs switches and guards, cut apart	10.25 to 10.75
Shoveling steel	10.00 to 10.50
Low phos. heavy melting steel	13.50 to 14.00
Drop forge flashings	6.00 to 6.50
Hydraulic compressed sheet	6.50 to 7.00
Axle turnings	7.00 to 7.50
Per Net Ton	
Iron angles and splice bars	14.00 to 14.50
Steel angle bars	9.50 to 10.00
Iron arch bars and transoms	14.00 to 14.50
Iron car axles	18.00 to 18.50
Steel car axles	12.50 to 13.00
No. 1 busheling	8.50 to 9.00
No. 2 busheling	6.00 to 6.50
Cut forge	9.00 to 9.50
Pipes and flues	5.50 to 6.00
No. 1 railroad wrought	9.50 to 9.75
No. 2 railroad wrought	9.00 to 9.50
Steel knuckles and couplers	11.00 to 11.50
Coil springs	11.75 to 12.25
No. 1 machinery cast	12.50 to 13.00
Low phos. punchings	11.00 to 11.50
Locomotive tires, smooth	9.75 to 10.25
Machine shop turnings	3.50 to 4.00
Cast borings	5.00 to 5.50
Stove plate	11.50 to 12.00
Grate bars	10.00 to 10.50
Brake shoes	10.25 to 10.75
Railroad malleable	11.25 to 11.75
Agricultural malleable	11.25 to 11.75
Country mixed	7.00 to 7.50

Boston

BOSTON, June 28.

Pig Iron.—Foundries show more interest, but no large individual sales are reported. Exclusive of the Westfield, Mass., lot, noted last week, estimated sales this week are about 4000 tons, divided largely into car, 100, 200 and 300-ton lots. Most of this is classified as resale iron, but, with the exception of 1800 tons Buffalo, eastern Pennsylvania and Virginia, practically all of it will be shipped from furnace yards. Indications are furnaces, anxious for business, are naming lower prices than heretofore on the pretext the iron is resale. The 1800-ton lot was sold on a delivered basis of $27 for silicon, 1.75 to 2.25, regardless of furnace grade. A feature of sales this week was the splitting up of silicons. The lowest price quoted on Pittsburgh district iron was $20.50 furnace for silicon 1.75 to 2.25, or about $26 delivered Framingham, the foundry taking 200 tons at that figure and 200 tons eastern Pennsylvania on the same delivered base. Eastern Pennsylvania, silicon 2.50 to 3, sold at $22 and $23 furnace, which figures out around $21 base. Buffalo, silicon 1.75 to 2.50, sold at $20.75 furnace and silicon 2.50 to 3 at $20.90, third quarter delivery, to Worcester, Mass., district foundries. Reports of $23 Virginia iron cannot be substantiated here. Virginia, silicon 1.75 to 2.25, can be had for $25 furnace and possibly as low as $24 in round tonnages. Alabama iron is not a market factor at the present. Sales include a car resale Lake Superior charcoal to the Boston Navy Yard at less than $35 base, and 50 tons malleable to a nearby foundry at $28.15 delivered or around $24 furnace. More inquiries for iron are reported than has been the case before in many months. Delivered prices follow:

East. Penn. silicon 2.25 to 2.75	$25.56 to $28.56
East. Penn., silicon 1.75 to 2.25	25.06 to 28.06
Buffalo, silicon 2.25 to 2.75	25.96 to 29.46
Buffalo, silicon 1.75 to 2.25	25.46 to 28.46
Virginia, silicon 2.25 to 2.75	33.58 to 34.58
Virginia, silicon 1.75 to 2.25	32.58 to 33.58
Alabama, silicon 2.25 to 2.75	33.16 to 33.66
Alabama, silicon 1.75 to 2.25	32.66 to 33.16

Coke.—New England producers of foundry coke report a decided improvement in last half contract bookings, but almost no increase in the demand for spot. Many foundries are contracting for smaller tonnages for the last half than they did for the first, indicating they anticipate no increase in business. The lack of improvement in spot coke business in a measure offsets the increased interest in pig iron, and

suggests that buying of the latter is of a temporary nature. Connellsville foundry cokes are offered as low as $4.25 f.o.b. ovens, but actual sales are limited to very small tonnages.

Warehouse Business.—Local warehouse prices on blue annealed sheets are down 25c., and on black and galvanized 35c. per 100 lb. Demand even at new prices is limited and spotty. The movement of iron and steel shows no increase, buying continuing on a hand-to-mouth basis. Jobbers can buy stock from large manufacturing concerns, who are anxious to sell, about as cheaply as from mills; consequently there is little incentive to place business with the latter. Machine, common carriage, Eagle carriage and stove bolts are considerably lower. Middle West semi-finished nut makers offer them on this market at concessions. Cut washers are quoted at list less 3c., as against list less 2c., heretofore.

Jobbers now quote: Soft steel bars, $3.18 per 100 lb. base; flats, $4.18 to $4.28; concrete bars, $3.18 to $3.45½; tire steel, $4.25 to $4.75; spring steel, open hearth, $5.50; crucible, $11.50; steel bands, $3.83 to $4.48; steel hoops, $4.38; toe calk steel, $5.25; cold rolled steel, $4.65 to $5.15; structural, $3.18 to $3.28; plates, $3.28 to $3.50; No. 10 blue annealed sheets, $4.53; No. 28 black sheets, $5.85; No. 28 galvanized sheets, $6.85; refined iron, $3.18 to $5; best refined, $5; Wayne iron, $8.50; Norway iron, round, ¼-in. to 2½-in., 8c. per lb. net; other sizes, 10c. base.

Finished Material.—The New York, New Haven & Hartford Railroad Co. bought its bars, plates, angles, etc., for repairing 1000 cars, at 2c. f.o.b. Pittsburgh. The Fore River Works, Bethlehem Shipbuilding Co., Ltd., bought 200 tons of plates from the Worth Steel Co. at 2c. Most mill interests are quoting 2.20c. on plates, but as low as 1.95c. on as little as car lots has been named. Bids are in on 300 tons structural steel for a municipal building, Boston. The American Bridge Co. is awarded the steel for a $250,000 plant building by the Bailey Oil Cloth Co., Winthrop, Me. The tonnage involved was not made public. The Providence Iron & Steel Co., Providence, R. I., is awarded the steel for a West Warwick, R. I., school; the New England Structural Steel Co., Boston, for a boiler house, Cambridge, Mass.; and the Porcupine Co., Bridgeport, Conn., for the Crane Co., that city, boiler house; the three tonnages to be taken from stock. Bids will soon be asked on a round tonnage of structural steel for a Manchester, N. H., bridge. The Lorraine Mills have sold 500 tons girder rails to the Eastern Massachusetts Street Railway Co. Crossover rails are in excellent demand, local producers working their shops on full time.

Old Material.—The market has settled back into an inactive condition. New England foundries show little, if any, interest in machine cast or stove plate, but it is believed some will be obliged to place orders next month. Chemical interests are buying cast iron borings slightly more freely, paying as high as $4.50 f.o.b. shipping point in a few instances. Inquiries on railroad wrought have stiffened the market about 50c., while No. 1 heavy melting steel and wrought pipe are as much lower, due to the withdrawal of prospective customers from the market.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$17.00 to $17.50
No. 2 machinery cast	15.00 to 16.50
Stove plate	15.00 to 16.00
Railroad malleable	14.00 to 15.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$5.50 to $6.00
No. 1 railroad wrought	10.50 to 11.00
No. 1 yard wrought	8.50 to 9.00
Wrought pipe (1-in. in diameter, over 2 ft. long)	6.50 to 7.00
Machine shop turnings	3.00
Cast iron borings, rolling mill	3.00
Cast iron borings, chemical	3.00 to 3.50
Blast furnace borings and turnings	3.00
Forged scrap and bundled skeleton	5.00 to 5.50
Street car axles and shafting	12.00 to 12.50
Car wheels	11.50 to 12.00
Rerolling rails	9.00 to 10.00

The Marks Steel Supply Co., 10800 Quebec Avenue, Cleveland, has been organized with an authorized capital stock of $300,000 and has taken over the business of the Leo H. Marks Steel Supply Co. Leo H. Marks is president and treasurer, Mort Marks vice-president and sales manager and Reuben Shapiro is secretary.

New York

NEW YORK, June 28.

Pig Iron.—One firm has sold 2000 tons of Buffalo iron, silicon 2.50 to 3, at $22, furnace, in numerous lots to customers scattered over the East, but Buffalo iron has been sold in small quantities at as low as $21 for No. 2X and $20 for No. 2 plain. These sales illustrate the irregularity of the market, which extends also to eastern Pennsylvania irons, though the latter have not been active. The market continues extremely dull.

We quote delivered in the New York district as follows, having added to furnace prices $2.52 freight from eastern Pennsylvania, $5.46 from Buffalo and $6.16 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$27.52 to $28.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	26.52 to 27.52
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	25.52 to 26.52
Buffalo, sil. 1.75 to 2.25	25.46 to 26.46
No. 2 Virginia, sil. 1.75 to 2.25	29.16 to 30.16

Ferroalloys.—The market for both ferromanganese and spiegeleisen continues featureless. The sale of a carload of spiegeleisen is reported and bids have been opened on 100 net tons of ferromanganese for delivery over the next year for the use of one of the Ordnance Department plants. The lowest bid on this was the equivalent of $72.80, delivered at the plant, for British alloy, which is somewhere near $70, seaboard, as compared with the prevailing quotations heretofore of $75. There is no question but that prevailing quotations for either domestic or foreign ferromanganese could be shaded were there a fair test of the market. High-grade manganese ore continues nominal at the quotations noted below, which is also true of 50 per cent ferrosilicon.

Ferromanganese, domestic, delivered, per ton	$80.00
Ferromanganese, British, seaboard, per ton	$75.00
Spiegeleisen, 20 per cent, furnace, per ton	$30.00 to $32.00
Ferrosilicon, 50 per cent, delivered, per ton	$69.00 to $70.00
Ferrotungsten, per lb. of contained metal	48c. to 58c.
Ferrochromium, 6 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr	16c. to 16.50c.
Manganese ore, foreign, per unit, seaboard	22.50c.

Finished Iron and Steel.—The impression is strong in the local steel trade that prices of plates, shapes and bars will be formally reduced $5 to $7 a ton from the April 13 schedule of 2.20c. for plates and shapes and 2.10c. for bars. The reduction is expected this week. A uniform reduction of $7 a ton would make plates and shapes 1.85c. and bars 1.75c. Actually, however, the reduction would not be large on plates, which are now obtainable at 1.90c., Pittsburgh, but shapes are still held at 2c. to 2.20c. and bars at 2c. to 2.10c. Representatives of the steel companies were firmly convinced to-day that these, or approximate, reductions would take place before the end of the week, but had no definite information from their general sales departments. The $5 a ton reduction on sheets has become general and blue annealed are now quoted at 2.85c., black at 3.75c. and galvanized at 4.75c., Pittsburgh. Wire products are weak, nails in particular. It is reliably reported that a considerable number of sales have been made at $2.90 per keg, while less reliable reports are that some quotations have been as low as $2.75. Cement coated nails have been reduced by leading makers from $2.60 to $2.50 per 100 lb. keg, Pittsburgh. The extra for galvanizing wire, 14 gage and heavier, has been reduced from 70c. to 50c. per 100 lb. Following a slight spurt in inquiry for structural steel a week or so ago, the market has become extremely dull again, probably because of the expectation of lower prices on shapes. New inquiries include 1200 tons for airplane hangars at Aberdeen, Md., and 400 tons for a freight terminal for the New York State barge canal at Rochester, N. Y. The Bethlehem Steel Bridge Corporation will fabricate 350 tons for a bridge for the Lackawanna Railroad and 50 tons for a bridge for the Central Railroad of New Jersey. Car builders continue to hold expectations of car repair orders, but some that have been estimated upon may not be let until the fall. The Pittsburgh & West Virginia Railroad has awarded 300 steel car bodies to the Cambria Steel Co., about 2400 tons of steel being required. A car company is inquiring for 3000 to 6000 tons of plates for new cars, but the order for the cars apparently has not yet been placed, so the purchase of the plates at this time is in

doubt. Steel export companies are interested in the revival of the Bombay, India, pipe project, involving 77,000 tons of steel plates, which was up about two months ago. Information received by cable is that the city of Bombay has raised the necessary money and that the work will go ahead. Competition between English and American mills and pipe fabricating companies is keen, with some advantage in price, it is stated, in favor of this country.

Prices unchanged. We quote for mill shipments, New York, as follows: Soft steel bars, 2.38c. to 2.48c.; plates, 2.28c. to 2.58c.; structural shapes, 2.38c. to 2.58c.; bar iron, 2.28c.

Warehouse Business.—Although business shows no improvement over the past few weeks, effective June 27, prices on bars, structural material, plates and sheets were reduced by the warehouses in this district. The reduction represents a drop of about $2 per ton. Soft steel bars are now quoted at 3.13c. per lb. and all structural material at 3.23c. per lb. base. Plates are now consistently quoted by dealers at 3.23c. per lb. base. No. 10 gage blue annealed sheets have been reduced from 4.23c. to 3.88c. per lb., a drop of 35c. per 100 lb., while black sheets are down 63c. per 100 lb. and galvanized sheets, No. 28 gage, are generally quoted at 5.75c. per lb., with sales in some instances at 5.50c. per lb. Tire steel has been reduced to 3.13c. per lb. for iron finish and 3.33c. per lb. for smooth finish. The situation in brass and copper is unchanged and iron and steel pipe shows no activity. We quote prices on page 1806.

High Speed Steel.—The market shows little change for the better. One producer reports that a customer building machine tools, whose normal consumption is about 3500 lb. per month, purchased 1400 lb. in April, about 300 lb. in May and the June purchase will be even smaller. Prices remain nominally at from 90c. to $1 per lb. for 18 per cent tungsten high speed steel with slightly lower prices reported on resale lots and large orders.

Cast-Iron Pipe.—It is admitted freely that an attractive tonnage inquiry would bring out prices lower than quoted herewith. Because of reduced prices in other districts, price action in this district will be watched with especial interest. Quotations for carload lots, f.o.b. New York, follow: 6-in. and larger, $53.30; 4-in. and 5-in., $58.30; 3-in., $68.30, with $4 additional for Class A and gas pipe.

Old Material.—Fewer mills are buying scrap. One prominent eastern Pennsylvania mill is ordering all material previously purchased to be shipped by July 1. The most activity has been in cast scrap, but even this is very slight. Brokers and dealers are not expecting much business in July and August.

Buying prices per gross ton, New York, follow:

Heavy melting steel	$7.00 to $7.50
Rerolling rails	10.00 to 10.50
Relaying rails, nominal	37.50 to 40.00
Steel car axles	10.50 to 11.00
Iron car axles	17.00 to 18.00
No. 1 railroad wrought	10.50 to 11.00
Wrought iron track	7.25 to 7.50
Forge fire	5.00 to 5.50
No. 1 yard wrought, long	8.50 to 9.00
Light iron	2.00 to 2.50
Cast borings (clean)	3.50 to 4.00
Machine-shop turnings	2.50 to 3.50
Mixed borings and turnings	2.50 to 3.00
Iron and steel pipe (1 in. diam., not under 2 ft. long)	8.00 to 8.50
Stove plate	9.00 to 9.50
Locomotive grate bars	8.50 to 9.00
Malleable cast (railroad)	8.00 to 8.50
Old car wheels	12.50 to 13.00

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast	$16.00 to $17.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	14.00 to 15.00
No. 1 heavy cast, not cupola size	13.00 to 14.00
No. 2 cast (radiators, cast boilers, etc.)	9.50 to 10.50

The Hazard Wire Rope Mfg. Co., Wilkes-Barre, Pa., has effected an agreement with employees, totaling about 800, who declared a strike on April 5, in protest against a wage reduction of 12 per cent. The men have agreed to return to work under a 7¾ per cent wage cut. The company will re-employ the men on a basis of seniority and those who have the largest families to support.

St. Louis

ST. LOUIS, June 28.

Pig Iron.—While there is occasional buying of small lots, car lots, etc., for prompt delivery, and once in a while an order running as high as 100 tons, there is no real activity in the pig iron market and none is expected until fall. The prices reported range from $22 to $24 per ton, Granite City, for pig iron running 1.75 to 2.25 per cent silicon, the product of the East Side furnace, and there are reports of $21, Chicago, for No. 2 Northern, which would place that iron in fair competition with the prices made by the Granite City plant. Nothing at all is being heard of No. 2 Southern, as no prices have been made by furnaces of the Birmingham district which would enable competition with either the Granite City or Chicago district furnaces. The West Side furnace is still down and making no sales. Foundries are running at as low an output as at any time in the past and are not looking for any activity under 60 days at least.

Coke.—No transactions of any consequence are taking place in coke, as there is no need for the fuel in the present state of the foundry business. The quotation now being made on Connellsville coke, best 72-hr. selected, is $5 to $5.50 at the oven, but this is nominal, as no transactions are taking place. Wise County, Va., coke is similarly quoted at $5.50 to $6 per ton. No movement is reported in by-product coke from local plants, aside from some domestic business.

Finished Iron and Steel.—No changes in quotations are reported by the mill representatives and there has been no increase of activity in the demand either for current consumption or for future delivery. The warehouse situation is about as recently reported, save that No. 10 blue annealed sheets are now quoted at 3.97½, No. 28 black sheets at 5.25c. and No. 28 galvanized, black sheet gage, at 6.20c.

Old Material.—The scrap market shows no life in any direction. Consumers with contracts are taking in material only under definite need and with severe inspection. The dealers are disinclined to do any but small trading in immediate lots which show a profit with occasionally a purchase to lay down in the yards. No large transactions have been reported in many weeks and the lack of activity is expected to continue through the remainder of the summer and possibly into the fall. Dealers, in fact, wherever there is a transaction, even of the smallest, are making their own market.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Iron rails	$12.50 to $13.00
Steel rails, rerolling	11.50 to 12.00
Steel rails, less than 3 ft.	11.00 to 11.50
Relaying rails, standard section, subject to inspection	25.00 to 27.50
Car wheels	11.50 to 12.00
No. 1 railroad heavy melting steel	10.50 to 11.00
Heavy shoveling steel	9.50 to 10.00
Ordinary shoveling steel	9.00 to 9.50
Frogs, switches and guards cut apart	10.50 to 11.00
Ordinary bundled sheet	3.75 to 4.25
Per Net Ton	
Heavy axle and tire turnings	4.50 to 5.00
Iron angle bars	9.50 to 10.00
Steel angle bars	9.25 to 9.75
Iron car axles	18.00 to 18.50
Steel car axles	12.00 to 12.50
Wrought arch bars and transoms	12.00 to 12.50
No. 1 railroad wrought	8.50 to 9.00
No. 2 railroad wrought	8.50 to 9.00
Railroad springs	9.50 to 10.00
Steel couplers and knuckles	9.50 to 10.00
Locomotive tires, 42 in. and over, smooth inside	8.00 to 8.50
No. 1 dealers' forge	6.00 to 6.50
Cast iron borings	6.00 to 6.50
No. 1 busheling	9.00 to 9.50
No. 1 boilers, cut to sheets and rings	5.00 to 5.50
No. 1 railroad cast	11.00 to 11.50
Stove plate and light cast	10.50 to 11.00
Railroad malleable	8.50 to 9.00
Agricultural malleable	8.50 to 9.00
Pipes and flues	6.50 to 7.00
Railroad sheet and tank	4.50 to 5.00
Railroad grate bars	6.50 to 7.00
Machine shop turnings	3.00 to 3.50
Country mixed	6.50 to 7.00
Uncut railroad mixed	7.00 to 7.50
Horseshoes	9.00 to 9.50
Railroad brake shoes	6.50 to 7.00

Cincinnati

CINCINNATI, June 28.

Pig Iron.—An inquiry for 700 tons, 500 of which is malleable, for the American Car & Foundry Co.'s Huntington, W. Va., plant, is before the trade, and will likely be closed this week. This is the only inquiry of any consequence, though the offer of a central Ohio melter to buy 200 tons of malleable at his price is still open. A sale of 500 tons of Southern iron to the American Radiator Co. for Birmingham delivery was reported, and 100 tons of Northern iron was taken by an Indiana melter. An Ohio melter has made an offer on several hundred tons of Southern iron at $20, Birmingham, but has not been able to place the business with a furnace. Prices are practically unchanged. Reports are heard that under $21 can be done on Southern iron, but there is evidence that some furnaces would not now consider $21.50 on any tonnage. On carload business the market is quotable at $22 to $22.50 but $21.50 has been done on 500 tons. Ironton furnaces are holding firmly at $23, and some resale material from this district is commanding the same figure. Chicago iron has been quoted at $20.50, furnace, but on carload lots the lowest heard is $21. The Portsmouth stack of the Whitaker-Glessner Co. will blow out during the week and most of the steel plants operating in this district will close for two weeks on July 1.

Based on freight rates of $4.50 from Birmingham and $2.52 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$26.00
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	26.50
Ohio silvery, 8 per cent sil	38.02
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	25.52
Basic, Northern	24.52
Malleable	25.52

Finished Material.—Chief interest in the market centered in the opening of bids for the stadium at Ohio State University at Columbus. This project calls for 4500 tons of structural steel, and approximately 1000 tons of reinforcing bars. The low bidder for the general contract was the E. H. Latham Co., Columbus. Its figure was $1,328,180. The Mt. Vernon Bridge Co., Mt. Vernon, Ohio, was low bidder on the fabrication and erection of the steel work. It is said that the estimates for this structure were not to exceed one million dollars, which has been already subscribed. No award was made at the time of opening bids, but one is expected to be made Wednesday of this week. The Big Four Railroad took bids on approximately 400 000 tie plates but the company will readvertise owing to irregularity of bids. Some inquiries for railroad equipment material are being received, one of these involving a small tonnage of car axles. Continued improvement in business from railroads is expected. The India State Railway is reported to be negotiating a large order for car and locomotive axles, but so far as is known the business is still to be placed. Reports have been heard that an American manufacturer had received this order in competition with European manufacturers. In the finished material market, there is very little life. We note a sale of 100 tons of bars at the full price of 2.10c. Pittsburgh, but this is by no means the lowest price heard. Reinforcing bars rolled from old rails are reported to be available on the basis of 1.75c., Pittsburgh. There is very little sheet inquiry, and manufacturers with large stocks are reported to be selling surplus material considerably below the mill schedules. Persistent reports are heard in the trade of lower prices to be named by the Steel Corporation shortly after July 1. The action of two of its subsidiaries in meeting competition gives color to these reports.

Warehouse Business.—A slow but steady improvement in sales is reported by most of the local jobbers in iron and steel products. With the exception of nails, this improvement does not apply to wire products. Local jobbers will cut prices on blue annealed, black and galvanized sheets during the week, the new prices being 4.10c., 5c. and 6.25c., respectively. No other changes will be made for the present.

Iron and steel bars, 3.35c. base; hoops and bands, 4.05c. base; shapes, 3.45c. base; plates, 3.45c. base; reinforcing bars, 3.42½c. base; cold rolled rounds, 1½ in. and larger, 4.85c.; under 1½ in. and flats, squares and hexagons, 5.35c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, 5c.; No. 28 galvanized sheets, 6.25c.; wire nails, $3.50 per keg base; No. 9 annealed wire, $3.60 per 100 lb.

Coke.—The coke market in this territory is dull. From other districts inquiries for 3000 and 2500 tons respectively have been received. The Kentucky Solvay Co. at Ashland has placed 18 more ovens in operation, giving it a total of 36. Prices are unchanged from last week.

Old Material.—The scrap market has resumed its dullness after showing a little life. Shipping on old contracts is about the only present activity and this movement is very light. The Pennsylvania, Big Four and B. & O. have issued lists. Prices are, if anything, lower, the whole list being affected, and declines ranging from $1 to $5 a ton. The quotations given below are based on recent transactions.

We quote dealers' buying prices:

Per Gross Ton		
Bundled sheets	$5.00 to	$7.00
Iron rails	11.00 to	12.00
Relaying rails, 50 lb. and up	25.00 to	26.00
Rerolling steel rails	10.00 to	11.00
Heavy melting steel	8.50 to	9.50
Steel rails for melting	9.00 to	10.00
Car wheels	11.50 to	12.50
Per Net Ton		
No. 1 railroad wrought	8.50 to	9.50
Cast borings	4.50 to	5.00
Steel turnings	2.00 to	2.50
Railroad cast	11.00 to	12.00
No. 1 machinery	12.00 to	13.00
Burnt scrap	6.50 to	7.50
Iron axles	17.00 to	17.50
Locomotive tires (smooth inside)	8.50 to	9.50
Pipes and flues	6.00 to	6.50

M. A. Hanna & Co. have removed their Cincinnati offices to larger quarters at 807 Dixie Terminal Building. They are exclusive sales agents for the Marting Iron & Steel Co., Ironton, Ohio. B. S. Stephenson, recently transferred from the Pittsburgh office, is resident agent in charge of pig iron and iron ore sales, and W. T. McElroy continues as sales agent in charge of coal. H. D. Comey and William Kerber have become associated with this office as pig iron salesmen. Mr. Comey is a Princeton graduate and was previously connected with the Woodhill Road Works of the National Malleable Castings Co., Cleveland. Mr. Kerber was until Jan. 1 New York sales manager for the Witherow Steel Co., Pittsburgh. He is a graduate of Ohio State University.

Buffalo

BUFFALO, June 28.

Pig Iron.—The Buffalo market has such a wide variety of prices at the present time that it is difficult to determine what the actual market is. With the effort of a mill interest to sell an accumulation of pig iron through brokers at Eastern points, the market has reached the lowest level for several years. The price of the iron so offered is $21.50 base, and in the week just closed 2000 tons was sold at that figure. On the other hand two of the producers are quoting $23 base price, and in some instances are getting it. Other than sales made by the steel interest, buying in carload lots is the rule. The furnace which recently announced its intention to blow out because of the price situation is still offering iron. Sales of 500 tons of No. 2 plain at $22 have been made and a small quantity of No. 2X at $23. It is generally understood that the differentials have been abandoned. Buffalo furnaces were reluctant to admit this, but one producer has sold a grade of iron 2.75 to 3.25 silicon at $23 and a few days later sold a quantity of 3.25 to 3.75 silicon at the same price. Resale iron from time to time reported as active has now disappeared. Shipping on contracts made the last half of last year and the first quarter of this year is still going on. None of the Buffalo producers is quoting on delivery in advance of 60 days. The total of 15 inquiries with one office is 4000 tons. On malleable inquiry, $23 is being quoted, but no sales have developed.

We quote f.o.b. dealers' asking prices per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil	$22.75 to $23.50
No. 2X foundry, 2.25 to 2.75 sil	21.75 to 22.50
No. 2 plain, 1.75 to 2.25 sil	20.75 to 21.50
Basic (nominal)	21.00 to 22.00
Malleable (nominal)	23.00 to 24.00
Lake Superior charcoal	37.00

Finished Iron and Steel.—The trifling volume of business which has kept local mills and sales offices

in motion for several weeks has now abated and nothing is expected to occur before July 1. The rumor that price schedules will be revised as of that date is accepted locally as a fact and little business is being placed in consequence. Some fair sales of pipe in carload lots are reported and a number of small orders for the same material have been placed. Sheet prices now range from 3.75c. to 4.75c., and a sale of blue annealed sheets at 2.85c. has been made. Structural business continues about the same and a number of new jobs are now being figured. A warehouse at Rochester, N. Y., for the New York State barge canal, involving 400 tons; a steel and concrete bridge at Troy, requiring 500 tons, and a public school at Niagara Falls, N. Y., which will take 200 tons, are all being figured by Buffalo fabricators. A mill which is entirely shut down is selling extremely small lots of bars, but it has no inquiry on hand and nothing in sight to indicate any change in the near future.

We quote warehouse prices f.o.b. Buffalo as follows: Structural shapes, 3.25c.; plates, 3.25c.; plates, No. 8 gage, 4.10c.; soft steel bars and shapes, 3.15c.; hoops 3.85c.; blue annealed sheets, No. 10 gage, 3.90c.; galvanized steel sheets, No. 28 gage, 6.05c.; black sheets, No. 28 gage, 5.05c.; No. 9 gage annealed wire, 4.35c.; cold rolled strip steel, 8.15c.

Warehouse Business.—Sheet prices have been revised but there is little business in either sheets or bars. Structural material is moving at a fair rate. Some inquiry has been received from railroads for material to use in car repairing, and while most of this business is expected to be placed at the mills, warehouses expect to be factors. Fair movement of reinforcing bars is reported.

Old Material.—While prices are nominal and little or nothing moving, it is generally believed that material can be bought less than is now quoted. Only one Buffalo dealer is known to be a bidder for the allotments of material offered by the Government. On the lot of 110,000 tons of steel offered by the Shipping Board at Hog Island, and on the 40,000 tons on which bids were opened last week, but one Buffalo dealer is interested. Borings are being offered by automobile plants, but little is taken. One manufacturer east of Buffalo has permitted old material of various kinds to accumulate since Jan. 1, refusing to sell at the present market.

We quote dealers' asking prices per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$12.00 to $12.50
Hydraulic compressed	9.00 to 9.50
Low phos., 0.04 and under	17.00 to 18.00
No. 1 railroad wrought	13.00 to 14.00
Car wheels	14.50 to 15.00
Railroad malleable	10.50 to 11.50
Machine shop turnings	6.00 to 7.00
Heavy axle turnings	9.00 to 10.00
Clean cast borings	6.00 to 7.00
Locomotive grate bars	10.50 to 11.50
Wrought pipe	8.00 to 9.00
No. 1 busheling	9.50 to 10.50
Stove plate	14.00 to 15.00
Bundled sheet stampings	7.00 to 8.00
No. 1 machinery cast	17.50 to 18.00

Cleveland

CLEVELAND, June 28.

Iron Ore.—As was to be expected, there has been very little activity in the iron ore market since the establishment of 1921 prices at a reduction of $1 a ton. According to estimates of some of the ore men, the aggregate of sales so far including purchases made in the open market before and after the naming of this season's prices, and actual tonnage booked for 1921 delivery under long time contracts, has been about 500,000 tons. A few small lot inquiries are pending but it is doubtful whether these will result in the early placing of orders. Further curtailments of mining operations are being placed in effect. These include considerable cutting down of operations in some of the Steel Corporation properties which have been producing ore at somewhat near normal capacity. One large Mesabi open pit mine, the Mahoning mine, which is owned by five consuming interests, started production June 1 on a schedule of 1,500,000 tons for the season, but this has been gradually cut down to a 500,000 ton schedule and a proposal to further reduce operations to a 300,000 ton schedule will be considered this week. Reports from the East indicate that practically no foreign ore is coming into this country at the present time. It is claimed that for the highest grade of foreign ore a price of 10c. per unit at dock is about the lowest quotation that is being made. This brings the price up to 12c. or 13c. delivered to some of the Eastern furnaces. However, this price is so much below the price of lake ore delivered in the East that Lake Superior ore interests have no hope of booking any Eastern business. Recently prices as low as 8c. a unit on foreign ore were reported from the East, but this price was due at least to some extent to the bringing in of cargoes that had not been sold and which shippers were anxious to dispose of. With shipping orders very light, some of the lake ore firms are unable to provide cargoes for the boats of vessel interests with which they have contracts. Ore contracts this year are being made without a rider giving buyers the benefit of any reductions in freight rates. However, shippers do not expect any reduction in freight rates before the close of the season. The hearing of their application for a reduction in rail rates is set for July 25, but a decision in that case is not expected before the close of the season of navigation.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, $6.45; Old range non-Bessemer, 51½ per cent iron, $5.70; Mesabi Bessemer, 55 per cent iron, $6.20; Mesabi non-Bessemer, 51½ per cent iron, $5.55.

Pig Iron.—Foundry iron has further declined in price 50c. or more a ton. The American Radiator Co. again came into the market during the week with an inquiry for 3000 to 4000 tons for its Buffalo, Detroit, Springfield and Titusville plants. On this inquiry, at least two producers quoted $21, but both were advised that lower quotations had been made. In this connection, unconfirmed reports are in circulation that foundry iron is being quoted as low as $20 in the Valley district. However, some producers are still asking $22. The past week has been one of the dullest of the year in the market, virtually no inquiry coming out except that of the radiator company. Locally the market has sagged to $23 for No. 2 foundry delivered and it is probable that that price can be shaded. A small lot was sold at under $23, but in this case the seller will deliver an equal amount of high priced iron on an old contract. No new inquiries are pending. Pig iron shipments by local interests with one exception will show a falling off in June as compared with May. One producer that secured some new releases this month will ship about 1000 tons more in June than in May. The McKinney Steel Co. expects to blow out one of its Cleveland furnaces this week. This company now has two Cleveland furnaces in blast, one of these having been started a few weeks ago.

We quote delivered Cleveland as follows, based on the new freight rate, there being a 56c. switching charge for local iron, a $1.96 freight rate from Valley points, a $3.36 rate from Jackson and $6.67 from Birmingham:

Basic	$22.46
Northern No. 2 fdy., sil. 1.75 to 2.25	23.00
Southern fdy., sil. 2.25 to 2.75	29.42
Ohio silvery, sil. 8 per cent	38.86
Standard low phos., Valley furnace	$38.50 to 39.00

Finished Iron and Steel.—There is very little activity and interest among consumers is centered in possible price reductions by the Steel Corporation on July 1. While buyers apparently have no definite information on which to base expected reductions, many seem to take it as a foregone conclusion that reductions will be made. With prices showing a downward tendency, there is a marked disposition among consumers to withhold orders as long as possible. In the case of building work, there is usually considerable delay in placing large contracts and frequently bids are asked two or three times before the work is finally placed. The Bourne-Fuller Co., which started up two open-hearth furnaces in its Upson plant about April 1, will again shut down this plant this week for an indefinite period. Operations of local sheet and plate mills are very irregular. The most important development in the price situation during the week was the further sagging of plate prices to the extent that the 2c. price now has become quite general and reports of 1.95c. quotations have appeared. Steel bars and structural material are generally quoted at regular prices but a good inquiry would probably bring out concessions. Hard steel reinforcing bars are weaker,

a 1.85c. price having become quite general, and this might be shaded $1 a ton. The demand for reinforcing bars has improved. In the automobile field, the Ford Motor Co. is inquiring for an unspecified amount of steel, mostly in No. 9 gage for frames, and this business is expected to bring out keen competition between plate and hot-rolled strip mills. In the building field fabricators report an increase in inquiry for small building work. The Mount Vernon Bridge Co. has taken the Chesapeake & Ohio bridge at Louisville, requiring 1700 tons, and an inquiry has come from the Kanawha & Michigan Railroad for 600 tons for bridge work. The Masonic Temple project, Detroit, requiring 7000 tons of steel, for which bids were recently taken, has been held up probably until September and the Fort Wayne, Ind., hotel project requiring 1500 tons has been postponed until fall. Bids for the Commodore Perry Hotel, Akron, have been rejected and new proposals will be asked for. The E. P. Latham Co., Columbus, was low bidder for the Ohio State University stadium, requiring 4300 tons of structural material and about 1000 tons of reinforcing bars, and this contract is expected to be placed this week. The Republic Structural Iron Works was low bidder for the Glenville High School, Cleveland, requiring 200 tons. Bids are being taken for the George D. Harter Bank, Canton, Ohio, requiring 300 tons. The Port Arthur Shipbuilding Co. is inquiring for 1750 tons of plate and structural material for a boat. While the contract has not yet been placed, this inquiry is of special interest in that it is the first sign of any resumption in the lake shipbuilding industry, which has been inactive for the past year. Akron, Ohio, will take bids July 8 for 1800 tons of riveted steel pipe.

Cleveland warehouses quote steel bars at 2.99c.; plates, 3.09c.; structural shapes, 3.09c.; No. 9 galvanized wire, 3.75c.; No. 9 annealed wire, 3.50c.; No. 28 black sheets, 4.50c.; No. 28 galvanized sheets, 5.50c.; No. 10 blue annealed sheets, 3.60c. to 3.75c.; hoops and bands, 3.69c.; shafting, 4.25c.

Sheets.—The $5 a ton price reduction made by one independent mill and the American Sheet & Tin Plate Co., noted last week, has been generally adopted by other mills, but the new prices have not stimulated business and there seems to be some doubt whether present prices will hold. No shading is reported by the mills but lower than mill prices are being quoted on brokers' stocks.

Warehouse Business.—Following the reduction in mill prices, Cleveland jobbers have made price reductions of from $4 to $6 a ton on sheets. A reduction of $4 a ton has been made on galvanized wire as the result of a corresponding reduction made by mills on the galvanizing extra.

Old Material.—A little activity developed during the week among dealers who purchased compressed steel and shoveling turnings to cover contracts recently placed by the Weirton Steel Co. The sales of these grades were made at $9 to $9.50 for the former and $8.50 to $9 for the latter delivered, but this buying has subsided and prices on these grades are weaker. Generally the market is dull and prices for the most part are stationary. No inquiry is coming from the mills and consumers are accepting very little material on contracts.

We quote per gross ton delivered consumers' yards in Cleveland and vicinity as follows:

Heavy melting steel	$10.50 to $11.00
Steel rails, under 3 ft	11.50 to 12.00
Steel rails, rerolling	13.00 to 14.00
Iron rails	11.00 to 12.00
Iron car axles	18.00 to 19.00
Low phosphorus melting scrap	12.50 to 13.00
Cast borings	7.00 to 7.50
Machine shop turnings	4.50 to 4.75
Mixed borings and short turnings	7.00 to 7.50
Compressed steel	6.50 to 7.00
Railroad wrought	10.00 to 10.50
Railroad malleable	11.00 to 12.00
Light bundled sheet stampings	3.50 to 4.00
Steel axle turnings	8.00 to 8.50
No. 1 casting	16.00 to 16.50
No. 1 busheling	7.50 to 8.00
Drop forge flashings, over 10 in	5.50 to 6.00
Drop forge flashings, under 10 in	6.00 to 6.50
Railroad grate bars	12.75 to 13.00
Stove plate	12.75 to 13.00
Pipes and flues	6.00 to 7.00

Bolts, Nuts and Rivets.—The bolt market is weak. Some sales were made during the week at a 10 per cent reduction from regular prices and while manufacturers have not formally reduced prices the lower quotations have become fairly general. No concessions on nuts are reported in this market. Some new demand for bolts and nuts in less than car lots is coming from the railroads. Rivets are weak. The usual quotation on car lot orders has declined $2 a ton to 2.90c. for structural and 3c. for boiler rivets, but prices are irregular and a good-sized inquiry would probably result in a shading of these quotations.

Coke.—There have been further price declines on some makes of foundry coke and quotations range from $4 to $5 for standard Connellsville brands. A few car lot sales were reported.

Birmingham

BIRMINGHAM, ALA., June 28.

Pig Iron.—Almost like a bolt out of the sky several pipe interests closed deals for considerable Birmingham pig iron around June 23 to 25. A sanitary pipe interest bought 2000 to 2500 tons and the leading cast iron pipe interest, the United States Cast Iron Pipe & Foundry Co., also bought several thousand tons. One maker booked around 4000 tons for pipe shops during the week and another admitted booking several thousand tons. Judging from what came to the surface and from what admitted sales suggested, business for the week must have approximated 12,000 to 15,000 tons, the minimum being 10,000 tons. Two interests between them booked about 8000 tons. The base was $21.50 and $22. More went at $22 than might have been expected. Delivery on all the tonnage is practically in the Birmingham district, hence the business may be considered as non-competitive so far as iron selling districts are concerned. The inquiry is much better. Altogether it was the best week in several months. The buying was largely incident to pipe shop bookings, which is the same as to say that one reflects the other. Outside of the pipe business, very little other buying took place, sanitary manufacturing interests and special iron users having recently purchased about 800 to 1000 tons. Continuance of the heavier buying depends on pipe bookings. Frederic I. Thompson, Alabama member of the United States Shipping Board, has expressed his interest in securing the same 15 and 20 per cent rate differentials on iron and steel products via Warrior barge and Mallory lines to Eastern seaboard points as apply on southbound traffic. This indicates favorable actions and $2 less to get Alabama iron into New England. The Southern and Louisville & Nashville railroads will ask for fabricating in transit privilege on iron and steel for Birmingham. This points to securing that in the near future.

We quote per gross ton f.o.b. Birmingham district furnace, as follows:

Foundry, sil. 1.75 to 2.25	$21.50 to $22.00
Basic	20.50 to 21.00
Charcoal	35.00

Cast Iron Pipe.—The high pressure pipe market was featured by booking of the order for 5000 tons for Phoenix, Ariz., by the United States Cast Iron Pipe & Foundry Co. Sizes will run as high as 24 and 30 in. Detroit letting of 16,000 tons is expected to mature this week, also Akron's 6500 tons. The National Cast Iron Pipe Co. secured 750 tons from Brookfield, Mo., and 250 from Detroit. The Phoenix order is the largest booked in several months. Lower than $40 was named on the larger sizes, it is understood. The market hovers around $40. Pipe shops began ordering iron immediately on receipt of orders for pipe, which indicates no iron on yards. There is general expectation of a very considerable high pressure pipe business.

Coal and Coke.—Governor Kilby and domestic operators have agreed on appointment of a joint committee to inform the Alabama public of cost of coal at mines, freight from mines to different Alabama cities and cost of yard operations with a view to keep people posted as to reasonable prices for domestic coal and stop profiteering. Foundry coke is fairly active at $7.

Finishing Mills.—Gulf States Steel Co. will close down at the end of the week at blast furnace and open hearth plants, operating only two days a week in bar and wire mills owing to lack of new business. The Tennessee company remains at 50 per cent ingot capacity with rail and structural mills and car and ship plant

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in operation as well as intermittent operations in plate mill department.

Old Material.—Cast scrap is looking up since pipe shops have received an influx of orders, but all other items are extremely dull and quotations are nominal.

We quote per gross ton f.o.b. Birmingham district yard as follows:

Old steel rails	$10.00 to $11.00
No. 1 steel	9.00 to 10.00
No. 1 cast	16.00 to 17.00
Car wheels	16.00 to 17.00
Tramcar wheels	15.00 to 16.00
No. 1 wrought	13.00 to 14.00
Stove plate	9.00 to 10.00
Cast iron borings	6.00 to 7.00
Machine shop turnings	6.00 to 7.00

Philadelphia

PHILADELPHIA, June 28.

Further contraction of steel plants operations in the East will occur this week. During the first two weeks of July, and possibly longer, unless business picks up, nearly all of the Eastern plants will be wholly shut down or running at such a low rate as to make their operations almost negligible. The mills of the Alan Wood Iron & Steel Co. will be shut down for two weeks, and will not resume operations at the end of that period unless sufficient business has been booked. The Phoenix Iron Works will also shut down, while the Lukens, Worth and Central plate mills will be almost wholly shut down. The Midvale plant at Coatesville and the Eastern Steel Co. plant have not been operated for some time. The American Bridge Co. at Pencoyd is operating at a very low rate.

The disposition of the operators of the Eastern plants is to close their mills until the present situation is relieved. There is known to be a fair volume of business dammed up, particularly in structural lines, and there are expectations of considerable buying of plates for car repair work, but just how soon such orders will materialize is uncertain. It is surprising to the local trade, familiar with the car situation on Eastern roads, that car repair work has been held back so long. The Pennsylvania Railroad, for example, is known to have thousands of cars which must be repaired before they can be used again, and there are predictions of a car shortage during the grain and coal carrying season this fall unless a large number of these cars are shortly put into commission.

There is no appreciable change in the steel situation, buyers awaiting further reductions in prices, which they have been assured by sales representatives of some companies will come soon. Meanwhile, prices are very soft, 1.90c. on plates, 2c., or possibly 1.95c., on shapes, and 1.95c. or 2c. on bars being now quite freely quoted. It even appears likely that the new prices on sheets are not being firmly held, one small mill having quoted 2.75c., Pittsburgh, on blue annealed, which is $2 a ton below the figure now named by the larger producers.

Pig iron is weak, with price concessions being made wherever sufficient tonnage is in sight. A small tonnage of basic has been sold at a price equivalent to about $23.50, delivered eastern Pennsylvania.

Pig Iron.—There was spirited competition between Buffalo and eastern Pennsylvania furnaces for the order of a Plainville, Conn., melter, who inquired for 5000 tons of foundry iron. A part of the business is reported to have been placed at Buffalo at less than $20, furnace. Eastern Pennsylvania furnaces would not go this low, but are said to have quoted in the neighborhood of $22, furnace, on No. 2 plain. This is lower than the current quotations on business originating in the immediate Philadelphia territory. For shipment in this district, where Buffalo competition is not so close, the furnaces are quoting $24 on No. 2 plain and $25 on No. 2X, f.o.b. furnace, but in New England and other intermediate territory, where the Buffalo furnaces have an equally advantageous freight rate, the Eastern furnaces have named lower prices. However, Buffalo iron is being offered at low prices, particularly a lot of several thousand tons owned by a steel company, on which $20.75 for No. 2 plain and $20.90 for No. 2X has been named by brokers. The first sale of basic in many weeks was made a few days ago to a Harrisburg consumer, the quantity being 600 tons and the price equivalent to about $23.50, delivered eastern Pennsylvania. The iron was sold by a nearby furnace with a freight rate of only 56c. Among other sales of the week were 200 tons of No. 3 iron at $23.50, furnace, and 100 tons of No. 2 plain at $24, furnace. Most of the current business, which is small in the aggregate, is in carload lots. A Virginia pipe maker is inquiring for 6000 tons of foundry grades, but the placing of the business is conditional upon the award made of the Detroit cast iron pipe job.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 84 cents to $1.54 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25	$24.75 to $25.25
East. Pa. No. 2X, 2.25 to 2.75 sil.	25.50 to 26.25
Virginia No. 2 plain 1.75 to 2.25 sil.	31.74
Virginia No. 2X, 2.25 to 2.75 sil.	32.99
Basic deliv. Eastern Pa.	23.50 to 24.00
Gray forge	23.00 to 23.50
Standard low phos. (f.o.b. furnace)	38.00
Malleable	26.00 to 27.00
Copper bearing low phos. (f.o.b. furnace)	35.00

Ferroalloys.—There is no demand for ferromanganese or spiegeleisen. The former is obtainable at $75 to $80, delivered, and the latter at $28 to $30, furnace.

Semi-Finished Steel.—While it is believed that a good inquiry would bring out lower prices on billets, such inquiry is not being made, hence prices are nominally unchanged at $37 for rerolling quality and $42 for forging quality, f.o.b. Pittsburgh.

Plates.—Eastern plate mills lost out on the steel for the 50 tanks bought by the Sinclair Consolidated Oil Corporation, the business going to two Chicago fabricators. The total steel requirements are about 7500 tons. Inquiry for plates is extremely light. No business of importance is in sight except 3000 to 6000 tons being inquired for by two or three car companies, which are bidding on Erie Railroad cars. Plates are easily obtainable at 1.90c., Pittsburgh.

Structural Material.—There is apparently no attempt by some mills to hold prices on structural shapes at 2.20c., Pittsburgh. Business has been done at 2c. and 1.95c. is said to have been quoted. Considerable structural work is in prospect, but formal inquiries are not expected until the price situation has been clarified.

Bars.—There is virtually no demand for merchant steel bars, but there are a few inquiries for reinforcing bars, notably one of 1000 tons for the Ohio State University stadium at Columbus, Ohio, and another for 1500 tons for a bridge at Bethlehem, Pa. Steel bars are obtainable at 2c., Pittsburgh, and 1.95c. is reported to have been quoted.

Sheets.—Practically all producers of sheets are now quoting 2.85c. for blue annealed, 3.75c. for black and 4.75c. for galvanized. One small mill is reported to have shaded the blue annealed price $2 a ton. Very little business is being done.

Old Material.—The scrap market is very weak, and it is almost impossible to find a market for any grade. Some prices are lower this week. We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$11.00
Scrap rail	$10.00 to 10.50
Steel rails, rerolling	14.00 to 15.00
No. 1 low phos., heavy 0.04 and under	17.00 to 18.00
Car wheels	18.00 to 19.00
No. 1 railroad wrought	13.50 to 14.50
No. 1 yard wrought	12.50 to 13.00
No. 1 forge fire	10.00 to 10.50
Bundled sheets (for steel works)	8.00 to 8.50
No. 1 busheling	11.50 to 12.00
No. 2 busheling	10.00 to 11.00
Turnings (short shoveling grade for blast furnace use)	7.50 to 8.00
Mixed borings and turnings (for blast furnace use)	7.00 to 7.50
Machine-shop turnings (for rolling mill and steel works use)	7.50 to 8.00
Heavy axle turnings (or equivalent)	8.50 to 9.00
Cast borings (for rolling mills)	8.50 to 9.00
Cast borings (for chemical plants)	No market
No. 1 cast	17.00 to 18.00
Railroad grate bars	12.50 to 13.00
Stove plate (for steel plant use)	12.00 to 12.50
Railroad malleable	15.50 to 16.50
Wrought iron and soft steel pipes and tubes (new specifications)	11.50 to 12 00
Iron car axles	No market
Steel car axles	No market

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight Rates

Freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia	$0.35	St. Paul	$0.665
Baltimore	0.335	Omaha	0.815
New York	0.38	Omaha (pipe)	0.44
Boston	0.415	Denver	1.35
Buffalo	0.295	Denver (wire products)	1.415
Cleveland	0.24	Pacific Coast	1.665
Cincinnati	0.325	Pacific Coast, ship plates	1.335
Indianapolis	0.345	Birmingham	0.765
Chicago	0.38	Jacksonville, all rail	0.555
St. Louis	0.475	Jacksonville, rail and water	0.46
Kansas City	0.815	New Orleans	0.515
Kansas City (pipe)	0.77		

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver, the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 55c.; ship plates, 75c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 75c.; sheets and tin plates, 60c. to 75c.; rods, wire rope, cable and strands, $1; wire fencing, netting and stretcher, 75c.; pipe, not over 8 in. in diameter, 75c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zees, structural sizes, 2c.

Wire Products

Wire nails, $3 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.25 and shorter than 1 in., $1.75; bright Bessemer and basic wire, $2.75 per 100 lb.; annealed fence wire, Nos. 6 to 9, $2.75; galvanized wire, $3.25; galvanized barbed wire, $3.65; galvanized fence staples, $3.65; painted barbed wire, $3.15; polished fence staples, $3.15; cement-coated nails, per count keg, $2.60; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days, net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60½ to 63 per cent off list for carload lots, 59½ to 62 per cent for 1000-rod lots, and 58½ to 61 per cent for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$2.90
Large boiler rivets.....3.00
Small rivets.....60, 10 and 10 per cent off list
Small machine bolts, rolled threads,
60, 10 and 10 to 70 and 7½ per cent off list
Small sizes in cut threads,
60 and 10 to 65 and 10 per cent off list
Longer and larger sizes of machine bolts,
60 to 60 and 10 per cent off list
Carriage bolts, ⅜ in. x 6 in.:
Smaller and shorter, rolled threads,
60 and 5 to 65 and 10 per cent off list
Cut threads.....50, 10 and 5 to 60 and 10 per cent off list
Longer and larger sizes,
50 and 10 to 60 and 5 per cent off list
Lag bolts.....65 to 65 and 10 per cent off list
Plow bolts Nos. 1, 2 and 3 head....50, 10 and 5 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts ⅜-in. x 4-in.:
Smaller and shorter.....50, 10 and 5 per cent off list
Longer and larger sizes.....50 and 5 per cent off list
Hot pressed sq. or hex. blank nuts.....$4.00 off list
Hot pressed nuts, tapped.....$3.50 off list
C. p. c. and t. sq. or hex. nuts, blank.....$4.00 off list
C. p. c. and t. sq. or hex. nuts, tapped.....$3.50 off list
Semi-finished hex. nuts:
¼ to 9/16 in. inclusive U. S. S....80 and 10 per cent off list
Same sizes S. A. E.....80, 10 and 10 per cent off list
⅝ to 1 in. inclusive U. S. S. and S. A. E.,
70, 10 and 10 per cent off list
Stove bolts in packages.....80 and 10 per cent off list
Stove bolts in bulk.....80, 10 and 2½ per cent off list
Tire bolts.....65, 10 and 10 per cent off list
Track bolts.....4.35c. base

Square and Hex. Head Cap Screws

½ in. and under.....70 per cent off list
9/16 in. to ¾ in.....70 per cent off list

Set Screws

½ in. and under.....70 and 5 to 70 and 10 per cent off list
9/16 in. to ¾ in.....70 per cent off list

Rivets

Rivets, 1c. per lb. extra for less than 200 kegs. Rivets in 100-lb. kegs, 25c. extra to buyers not under contract; small and miscellaneous lots less than two tons, 25c. extra; less than 100 lb. of a size, or broken kegs, 50c. extra.

All prices carry standard extras f.o.b. Pittsburgh.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $48; chain rods, $48; screw stock rods, $53; rivet and bolt rods and other rods of that character, $48; high carbon rods, $58 to $73, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16-in. and larger, $3.25 to $3.40 base per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ½-in., ⅝-in., and 7/16-in., $3.25 base; 5/16-in., $3.25 to $3.40 base. Boat and barge spikes, $3.25 to $3.40 base per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Track bolts, $4.35 base per 100 lb. Tie plates, $2.50 per 100 lb.; angle bars, $2.75 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., $12.30 per package; 8-lb. coating, I. C., $12.60; 12-lb. coating, I. C., $14.30; 15-lb. coating, I. C., $15.30; 20-lb. coating, I. C., $16.55; 25-lb. coating, I. C., $17.80; 30-lb. coating, I. C., $18.80; 35-lb. coating, I. C., $19.80; 40-lb. coating, I. C., $20.80 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars, 1.95c. to 2.10c. from mill. Refined bar iron, 2.75c.

Welded Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛	50½	24	¼ to ⅜	+ 2½	+28½
¼ to ⅜	52½	26	½	27½	9½
½	56½	42	¾	33½	18½
¾	60½	48	1 to 1½	35½	20½
1 to 3	62½	50			

Lap Weld

2	54½	42	2	30½	16½
2½ to 6	58½	46	2½ to 6	33½	20½
7 to 12	54½	41	7 to 12	29½	16½
13 to 14	45	..			
15	42½	..			

Butt Weld, extra strong, plain ends

⅛	46½	29	¼ to ⅜	+10½	+43½
¼ to ⅜	48½	31	½	26½	14½
½	53½	42	¾	33½	19½
¾	58½	47	1 to 1½	35½	21½
1 to 1½	60½	49			
2 to 3	61½	50			

Lap Weld, extra strong, plain ends

2	52½	41	2	21½	18½
2½ to 4	56½	45	2½ to 4	24½	22½
4½ to 6	55½	44	4½ to 6	33½	21½
7 to 8	50½	37	7 to 8	24½	12½
9 to 12	45½	32	9 to 12	19½	7½

To the large jobbing trade an additional 1, 5 and 2½ per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

Boiler Tubes

The following are the discounts for carload lots f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
1¾ in.	19½	1½ in.	+10
2 to 2¼ in.	30	1¾ in.	List
2½ to 3 in.	41	2 to 2¼ in.	—10
3¼ to 13 in.	47	2½ to 2¾	—15
		3 to 3¼ in.	—16
		3½ to 4½ in.	—20

Carload Discounts on Standard Commercial Seamless—Cold Drawn

1 in.	56	2 to 2½ in.	17½
1¼ in.	49	2¾ and 4 in.	20
1½ in.	48	4½ to 5 in.	7½
1¾ in.	25		

Hot Rolled

3 to 4 in.....30

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department which will be subject to special negotiations.

Sheets

Prices for mill shipments on sheets of standard gage in carloads, f.o.b. Pittsburgh, follow:

Blue Annealed

Cents per Lb.		Cents per Lb.	
No. 8 and heavier	2.65	Nos. 11 and 12	2.85
Nos. 9 and 10 (base)	2.75	Nos. 13 and 14	2.95
		Nos. 15 and 16	3.05

Box Annealed, One Pass Cold Rolled

Cents per Lb.		Cents per Lb.	
Nos. 17 to 21	3.55	No. 28 (base)	3.75
Nos. 22 to 24	3.60	No. 29	3.85
Nos. 25 and 26	3.65	No. 30	3.95
No. 27	3.70		

Galvanized

Cents per Lb.		Cents per Lb.	
Nos. 10 and 11	3.75	Nos. 25 and 26	4.45
Nos. 12 to 14	3.85	No. 27	4.60
Nos. 15 and 16	4.00	No. 28 (base)	4.75
Nos. 17 to 21	4.15	No. 29	5.00
Nos. 22 to 24	4.30	No. 30	5.25

Tin-Mill Black Plate

Cents per Lb.		Cents per Lb.	
Nos. 15 and 16	3.55	No. 28 (base)	3.75
Nos. 17 to 21	3.60	No. 29	3.80
Nos. 22 to 24	3.65	No. 30	3.80
Nos. 25 to 27	3.70	Nos. 30½ and 31	3.85

Non-Ferrous Metals

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin	Lead		Zinc	
June	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
22.....	12.75	12.75	29.00	4.40	4.20	4.90	4.40
23.....	12.75	12.75	28.75	4.35	4.15	4.85	4.35
24.....	12.75	12.75	28.75	4.35	4.15	4.85	4.35
25.....	12.75	12.75	....	4.30	4.10	4.85	4.35
27.....	12.75	12.62½	29.00	4.40	4.15	4.75	4.25
28.....	12.75	12.62½	29.00	4.40	4.15	4.75	4.25

NEW YORK, June 28.

Midsummer dullness and the approaching Fourth of July holidays are by no means a stimulus to an already inactive market. Buying of copper is fair and prices are a little lower. The tin market is steady with moderate purchases reported. The lead and zinc markets continue practically unchanged with interest on the part of consumers or dealers at a low ebb and prices lower.

New York

Copper.—A report of the condition of the market depends upon the attitude of various sellers. Some of the large producers assert that there is practically no demand for copper and that business is stagnant, while others are free to say that if the market is met there is no difficulty in disposing of a fair amount of copper. The former class of sellers are practically out of the market, being unwilling to take orders for less than 13c., delivered, for early delivery, while the latter are daily doing a fair amount of business at an average of 12.87½c., delivered, or 12.62½c., New York, which we quote as the market for electrolytic copper for July delivery. Sales are reported as being fairly evenly divided between domestic and foreign consumers. The probable early termination of the coal strike in England is expected to develop buying from that source in the near future. The Lake copper market is largely nominal at practically the same level as the electrolytic market.

Tin.—About the middle of last week a fair business was done amounting to anywhere from 300 to 500 tons, bought mostly by two or three dealers with some consumers showing interest. Sales consisted mostly of future shipment Straits tin. All other days since then have been quiet and dull with the market close to stagnation. Prices have been fairly steady, those of spot Straits tin having hovered very close to 29c. with the quotation to-day being 29c., New York. The London market has also been quiet with fair sales reported. To-day the market over there was about £2 per ton higher than a week ago with spot standard quoted at £166 10s., future standard at £169 and spot Straits at £167 10s. per ton. Arrivals thus far this month have been 1540 tons with 2000 tons reported afloat.

Lead.—Late last week Wednesday the leading interest reduced its quotation from 4.50c. to 4.40c., both New York and St. Louis. Yesterday and Saturday a fair amount of buying is reported, but this movement was not followed up to-day. It is stated that in some special cases lead was offered down to 4.25c., New York, but there was no broad market at this level. On the whole the market has been quiet with the exception noted. In the outside market lead for early delivery can be obtained at 4.40c., New York, or 4.15c. to 4.25c., St. Louis.

Zinc.—There is a little more life to the market, with prices low, and some producers inclined to meet present levels, due to low ore prices and easier prospective labor conditions. Prime Western for early shipment is quoted and has sold at 4.25c., St. Louis, or 4.75c., New York, with some small spot lots sold at 4.20c., St. Louis. Demand is still confined to urgent needs for early consumption by galvanizers and brass makers.

Antimony.—There is practically no change with wholesale lots for early delivery quoted largely nominal at 4.87½c., New York, duty paid.

Aluminum.—The leading producer continues to quote 28c., f.o.b. plant, for virgin metal, 98 to 99 per cent pure, in wholesale lots for early delivery, with foreign metal of the same analysis obtainable down to 22c., New York, depending on the seller and the source of the metal.

Old Metals.—The market continues to decline and business is practically at a standstill. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	12.25
Copper, heavy and wire	11.25
Copper, light and bottoms	9.25
Heavy machine composition	11.25
Brass, heavy	7.25
Brass, light	5.25
No. 1 red brass or composition turnings	8.50
No. 1 yellow rod brass turnings	5.50
Lead, heavy	3.75
Lead, tea	3.00
Zinc	3.00

Chicago

JUNE 28.—Tin and lead have advanced while zinc has undergone a further drop. Tin has revived through purchases by large dealers at the low level. Lead has grown firmer as a result of a refusal by many independents to take further business at less than the trust price of 4.50c. Spelter continues to sag with no business developing to give support to the market. Old metal prices remain unchanged. We quote Lake copper at 13.25c. in carload lots; tin, 31c.; lead, 4.35c.; spelter, 4.45c.; antimony, 7.50c. On old metals we quote copper wires, crucible shapes, 8c.; copper clips, 8c.; copper bottoms, 7c.; red brass, 7c.; yellow brass, 5c.; lead pipe, 2.75c.; zinc, 2c.; pewter, No. 1, 17c.; tinfoil, 18c.; block tin, 21c., all of these being buying prices for less than carload lots.

St. Louis

JUNE 27.—The non-ferrous markets have been dull and weak during the past few days, with lead in car lots quoted at the close at 4.10c. and spelter at 4.30 to 4.35c. In less than car lots the figures have been: Lead, 4.75c.; spelter, 5.25c.; tin, 33c.; copper, 13.75c.; antimony, 7.50c. In the Joplin district ore continues weak with zinc blende, basis 60 per cent, ranging close to $20 per ton, and lead, basis 80 per cent, at $40 per ton. No calamine is being offered. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 4.50c.; heavy yellow brass, 7.50c.; heavy red brass, heavy copper and copper wire, 9c.; light copper, 8c.; pewter, 15c.; tinfoil, 18c.; zinc, 3c.; lead, 3.50c.; tea lead, 2c.; aluminum, 9c.

Twist Drills Reduced

Twist drill manufacturers have reduced prices, the reduction amounting to 20 per cent on carbon drills. New discounts to consumers are 50, 10 and 5 per cent off list for carbon drills, 20 and 5 off list for high speed drills up to 1½ in. in diameter, and 25 and 5 per cent off list for larger sizes, larger discounts being allowed jobbers. Resale drills in considerable quantities are still on the market and these are being offered at lower than manufacturers' prices.

A hollow metal ball calculated to be particularly valuable for ball valves is now made by the Seamless Hollow Ball Co., Highlandtown, Baltimore. The ball is made from one piece of metal, by a patented process, in various sizes and with thick or thin walls. Steel, brass, bronze, copper, Monel metal and aluminum are among the metals from which the balls are made.

The Foundrymen's Association and the Molders' Union, San Francisco, have entered into a new agreement, effective June 15, with reduction from $8 to $7.50 a day from this time until Aug. 15, when a further reduction to $7.12 will be made, this latter wage basis to remain in force for one year.

Metal Schedule Resembles 1909 Tariff

Pig Iron and Scrap Duties $2.50 in New Bill—Surprising Provisions for Ferromanganese and Other Alloys—Free List Products Restored to Dutiable List

(Special Telegram)

WASHINGTON, June 28.—The Committee on Ways and Means of the House of Representatives has completed consideration of the tariff bill and it will be introduced in the House Wednesday noon. Republicans of the House expect to hold a caucus Thursday and the bill will be taken up for consideration next Tuesday.

The metal schedule represents in many respects a return to the classifications and provisions of the Payne-Aldrich tariff of 1909. While there are ad valorem duties, the iron and steel paragraphs mostly provide for specific duties. These are in some cases equal to the duties of the Payne-Aldrich tariff and in others are slightly less. Practically all the iron and steel products which were on the free list in the Underwood tariff of 1913 are restored to the dutiable list. Pig iron is given a duty of $2.50 per ton, as in the Payne-Aldrich tariff. Scrap, which had $1 a ton duty in that tariff and is now on the free list, is given a duty of $2.50, the same as pig iron. Rails, cotton ties and certain wire products which are now on the free list are assigned duties in the new bill.

Below are given some of the principal iron and steel duties provided for in the new bill. It need scarcely be said that the bill will not pass in its present form. Some of the schedules, particularly those on ferroalloys, indicate confusion in the minds of committeemen as to the price relations of different products. In particular the provisions relating to ferromanganese show such confusion, but they are given below as they appear in the printed proposal of the committee:

Ferromanganese

Ferromanganese containing less than 1 per cent carbon, $10 per ton; ferromanganese in excess of 1 per cent, 2¾c. per lb. on the metallic manganese contained therein and ferromanganese containing less than 1 per cent carbon, 2¾c. on the manganese contained therein and 40 per cent ad valorem.

Pig Iron and Scrap

Pig iron, kentledge, spiegeleisen, scrap iron and steel, $2.50 per ton.

Chrome ore, chromium metal, ferrochrome, ferromolybdenum, ferrophosphorus, ferrotitanium, ferrotungsten, ferrovanadium, molybdenum, titanium, tantalum, tungsten, tungsten ore, wolfram metal and other alloys used in the manufacture of steel, not specially provided for, 20 per cent ad valorem.

Ferroalloys

Ferrosilicon, 15 per cent; manganese ore in excess of 30 per cent of metallic manganese, $4 per ton; ferromanganese containing less than 1 per cent carbon, $10 per ton; manganese ore or concentrates containing in excess of 30 per cent of metallic manganese, 1¼c. per lb. on the metallic manganese; ferromanganese containing in excess of 1 per cent carbon, 2¾c. per lb. on the metallic manganese contained therein; manganese metal, manganese-silicon, manganese-boron and ferromanganese containing less than 1 per cent of carbon, 2¾c. per lb. on the manganese contained therein and 40 per cent ad valorem; tungsten ore, 57c. per lb. on the metallic tungsten; ferrotungsten, metallic tungsten, 90c. per lb. on the tungsten contained therein. Ferrosilicon containing 8 per cent or more of silicon and less than 30 per cent, 3c. per lb. on the silicon contained therein; 30 per cent and less than 60 per cent, 3½c. per lb. on the silicon content; 60 to 80 per cent, 4c. on the silicon content; 80 to 90 per cent, 5c. per lb. on the silicon content; 90 per cent or more silicon, and silicon metal, 10c. per lb. on the silicon content. Ferrochrome containing 3 per cent or more carbon, 4½c. per lb. on the chromium contained therein; ferrochrome containing less than 3 per cent of carbon, 45 per cent ad valorem.

Muck Bar and Bar Iron

Muck bars and bar iron, square iron, rolled or hammered, comprising flats not less than 1 in. wide nor less than ⅜ in. thick, rolled iron, round iron not less than 7/16 in. in diameter, ¼c. per lb.; round iron in coils or rods, less than 7/16 in. in diameter and bars or shapes of rolled or hammered iron, not specially provided for, 5/10c. per lb.; iron in slabs, blooms, loops or other forms less finished than iron in shapes and more finished than pig iron, special castings, 2/10c. per lb., provided that iron bars, blooms, billets, slabs or loops, in the manufacture of which charcoal is used as fuel, shall be subject to a duty of 3/10c. per lb.

Ingots, Blooms, Bars

Steel ingots, cogged ingots, blooms and slabs by whatever process made; die blocks or blanks; bars and billets and tapered or beveled bars; mill shafting; pressed, sheared or stamped shapes, not advanced in value or condition by any process or operation subsequent to the process of stamping; hammer molds or swaged steel; gun barrel molds not in bars; alloys used as substitute for steel in the manufacture of tools; all descriptions and shapes of dry sand, loam or iron molded steel castings; sheets and plates and steel not specially provided for; all of the foregoing valued at not more than and not over 1c. per lb. 2/10 of 1c. per lb., valued above 1c. and not above 1½c. per lb. 3/10 of 1c. per lb.; valued above 1½c. and not above 2½c. per lb. 5/10 of 1c. per lb.; valued above 2½c. and not above 3½c. per lb. 8/10 of 1c. per lb.; valued above 3½c. and not above 5c. per lb. 1c. per lb.; valued above 5c. and not above 8c. per lb. 1½c. per lb.; valued above 8c. and not above 12c. 2c. per lb.; valued above 12c. and not above 16c. per lb. 2½c. per lb.; valued above 16c. and not above 20c. per lb. 3½c. per lb.; valued above 20c. and not above 24c. per lb. 4c. per lb.; valued above 24c. and not above 32c. per lb. 5c. per lb.; valued above 32c. and not over 40c. per lb. 20 per centum ad valorem; provided that on all steel circular saw blades there shall be levied an additional duty of ¼c. per lb.

Additional Duty

In addition to the rates of duty provided for in different titles or steel in all forms and shapes, by whatever process made, and by whatever name designated, whether classed, hot or cold-rolled or stamped or drawn containing more than 6/10 of 1 per centum of nickel, cobalt, vanadium, chromium, tungsten, molybdenum or any other metallic element used in alloying steel, there shall be levied and collected 20 per centum ad valorem; provided that manganese and silicon shall not be considered as alloying material unless present in the steel in excess of 1 per centum; provided further that an additional cumulative duty of $1.25 per lb. on the molybdenum content in excess of 1 per centum and 90c.

per lb. on the tungsten content in excess of 1 per centum shall be levied and paid on any of the above named articles.

Boiler and Other Plates

Boiler or other plates, iron or steel, except crucible plates, steel and saw blade steel not thinner than 141/1000 in. cut or sheared to shapes or unsheared and skelp iron or steel sheared or rolled in grooves, valued at 1c. per lb. or less, 7/20c. per lb.; valued above 1c. per lb. and not above 3c. per lb., 5/10c. per lb.; valued at over 3c. per lb. 20 per centum ad valorem.

Iron and Steel Sheets

Sheets of iron or steel, common or black of whatever dimensions, and skelp iron or steel, valued at 3c. per lb. or less, thinner than 141/1000 and not thinner than 38/1000 of 1 in., 45/100 of 1c. per lb.; thinner than 3/1000 and not thinner than 22/1000 in., 55/100 of 1c. per lb.; thinner than 22/1000 and not thinner than 10/1000 of an in., 75/100 of 1c. per lb.; thinner than 10/1000 in., 85/100 of 1c. per lb.; corrugated or crimped, 75/100 of 1c. per lb.; all the foregoing when valued at more than 3c. per lb., 25 per centum ad valorem; provided that all sheets or plates of common or black iron or steel not thinner than 141/1000 of an in. shall pay duty as plate iron or plate steel.

Tin Plate

All iron or steel sheets or plates, all hoops, bands or scroll iron or steel, excepting what are known commercially as tin plate, terne plate and taggers tin when galvanized or coated with zinc, spelter or other metals, or any alloy of these metals, shall pay 2/100c. per lb. more duty than shall the same when not so galvanized or coated; sheets or plates composed of iron, steel, copper, nickel or other metals with layers of other metal or metals imposed thereon by forging, hammering, rolling, or welding, 35 per centum ad valorem; sheets of iron or steel, polished, planished or glanced by whatever name designated, 1¼c. per lb.; provided, that plates or sheets of iron or steel, by whatever name designated, other than polished, planished or glanced herein provided for which have been pickled or cleaned by acid or by any other material or process, or which are cold-rolled, smoothed only, not polished, shall pay 2/100 of 1c. per lb. more duty than the rates provided on corresponding thicknesses of common or black sheet iron or steel.

Sheets or plates of iron or steel or taggers iron or steel coated with tin or lead or with a mixture of each of these metals or either of them as a component part by the dipping or any other process, and commercially known as tin plates, terne plates and taggers tin, 1 1/10c. per lb.

Structural Steel

Beams, girders, joists, angles, channels, cartruck channels, TT columns and posts, or parts or sections of columns and posts, deck and bulb beams, sashes, frames, and building forms, together with all other structural shapes of iron or steel, 35 per centum ad valorem.

Hoops and Bands

Hoop, band, or scroll iron or steel, not otherwise specially provided for, valued at 3c. per lb. or less, 8 in. or less in width and thinner than ⅜ and not thinner than 141/1000 of 1 in., 25/100 of 1c. per lb.; thinner than 141/1000 and not thinner than 38/1000 of 1 in., 35/100 of 1c. per lb.; thinner than 38/1000 of 1 in., 55/100 of 1c. per lb. Hoop or band iron or scroll iron or steel cut to length or wholly or partly manufactured into hoops or ties, coated or not coated with paint or any other preparation with or without buckles or fastenings for baling cotton or any other commodity, ¼c. per lb.

Before the above rates were officially announced, the Washington correspondent of THE IRON AGE sent the following based on reports as to what the rates would be:

Wire Rods and Wire

Wire rods, valued at not over 4c. per lb., 3/10c. per lb.; valued over 4c. per lb., 6/10 of 1c. per lb.; provided that all iron or steel rods smaller than 20/100 of 1 in. in diameter shall be classed and dutiable as wire.

Cold-rolled steel bars, ⅛c. per lb. in addition to the rate on rolled bars or rods; strip steel, 2/10c. per lb. when it is polished or cold rolled.

Round iron or steel wire, ¾ to 1½c. according to gage.

Barbed wire, plain and galvanized, and all wire for baling hay and other commodities, ½c.

Woven wire cloth, 25 per centum to 50 per centum.

Railroad Steel

Railway fish plate or splice bars, ¼c.; all other railway bars and railway bars made in part of steel, T rails or punched iron or steel, flat rails, 7/10c. per lb.

Railway wheels 1c. per lb.; ingots, etc., for same, ¾c.

Iron and Steel Pipe

Cast iron pipe including all castings or iron and cast iron plates which have been chiseled, drilled, machined or otherwise advanced, 10 per centum ad valorem.

Rolled pipe, lap-weld, butt-weld, steel tubes, pipe, etc., ¾c. to 1¾c.

Cast iron pipe, 10 per centum ad valorem.

Nuts, bolts and washers, 6/10c. per lb.; bolts, 1c. per lb.

Spiral and nut lock washers, 35 per centum ad valorem. Cut nails and spikes, 4/10c. up to 25 per centum ad valorem.

Shipping Board Purchases Tanks

WASHINGTON, June 28.—The Pittsburgh-Des Moines Steel Co. has been awarded the contract for supplying the Emergency Fleet Corporation with 14 55,000-bbl. steel tanks at $10,985 for each tank and will use its own material. The price is f.o.b. manufacturer's plant.

The Shipping Board has received bids on 26,270 tons of surplus steel, divided into six lots. Highest bidders on given lots and prices follow: Max Solomon, Pittsburgh, bid $10.21½ per net ton on 15,954 tons at Leetsdale, Pa., of McClintic-Marshall Co., the board to load material. Frank Samuel, Philadelphia, bid $12 if material is loaded by the board and $11.50 if loaded by bidder, on 6332 tons at Pottstown, Pa., plant of the McClintic-Marshall Co. Luria Brothers & Co., Philadelphia, bid $12.46, Shipping Board to load, and $12, bidder to load, on 1605 tons at the American Bridge plant at Elmira, N. Y. Nashville Bridge Co. bid $10, purchaser to load, for 1227 tons at its plant. Newport News Shipbuilding & Dry Dock Co., Newport News, Va., bid $10 for 811 tons at its plant, purchaser to load. Price Iron & Steel Co., Cleveland, bid $12.01, the Board to load, on 1135 tons at the Gary, Ind., plant of the American Bridge Co., and Paper, Calmenson & Co., St. Paul, bid $7.15 on 432 tons at the Superior, Wis., plant of the Globe Shipbuilding Co.

A reduction of 15c. an hour has been accepted by the Indianapolis local of the International Molders' Union, bringing the schedule to 75c. an hour. A year's agreement with employers is the basis of the acceptance; otherwise the men prefer to work from day to day.

James A. Campbell Calls for Quick Action

(*Continued from page* 1751)

is sick and it is high time for the doctor to prescribe for it. Diagnosis of the sickness will not save the life of the patient without a prescription.

Drifting to Government Control

"We will drift to Government control again if we don't act. Government control, with its billions of waste, for which you and I have to pay in taxes. After Government control of railroads would come Government control of the coal mines and after that Government control of industry. Many of the railroads are on the verge of receivership; several will go into the hands of receivers within 60 days if we who know the faults do not suggest and insist that they be remedied. Let us all carry the courage of our convictions into work."

Mr. Adams predicted a return to prosperity within six months. "Our natural resources are unscratched," he said. "Our producing machinery is in the pink of condition, men everywhere are anxous to get work. In the past it has been the experience that after money eases, the stock market moves up and then business increases. I have every reason to believe that the same sequence will follow in the present instance. It is my guess that the peak of money pressure in the Federal Reserve Banks is six months behind us. The big city banks seem to be just past their pressure peak, while it has not yet been reached by the rural banks. I therefore see strong prospects for a revival in business. Within the next six months, I believe there will be an upward movement; then there will be a tendency for a recession, followed by a stronger surge forward. If we back courage with intelligence and re-establish personal responsibility, we will, beyond the peradventure of a doubt, experience an era of unprecedented prosperity in this country."

The speeches followed a banquet at the Ohio Hotel, Youngstown, in the evening, President Sanborn acting as toastmaster.

MAKING PROGRESS

Plans for Reorganization of Departments—Census Office Powers

WASHINGTON, June 28.—In connection with well defined activities under way looking to the reorganization of government departments, timely suggestions have been made by Attorney Nathan B. Williams of the National Association of Manufacturers, which, he believes, would be to the interest of the Government and business alike. Not only does he seek to avoid duplication of effort among different Government departments, but also to bring activities strictly within jurisdiction of those branches of the Government in line with the organic acts creating them and to prevent branches of the Government taking up work not provided for by law. To bring this about, it is maintained, would safeguard the business organizations of the country and at the same time lend simplification and efficiency to Government activities, reduce expenses for the Government and the business world, relieve the latter of considerable annoyance, and lessen legislation.

Mr. Williams at present, in connection with this undertaking, is giving careful study to Government requests made upon business interests for statistical information the supplying of which should be in keeping with the protection of the legitimate and constitutional rights of the individual business unit.

Belongs in Census Bureau

It has been found, for instance, that an examination shows that work of the Geological Survey, and the Bureau of Mines of the Interior Department, and the Forestry Service of the Department of Agriculture has been and is being done which should by law be performed by the Census Bureau of the Department of Commerce. Moreover, it is contended that other statistics have been and are being gathered by the United States Tariff Commission, with full authority of the law creating it, which also could be done by the Bureau of the Census.

It is pointed out that the recent conference in Washington between coal operators and members of the executive and legislative branches of the Government supposedly had but one object in view, the collection and publication of vital statistics relating to the industry which may best serve the public and thereby react to the best interest, both of the coal trade in every branch and the consuming public. Such is the purpose Secretary of Commerce Herbert Hoover has in mind in co-operating with the various trades, including iron and steel, of the country. The form and purpose of Mr. Hoover's conferences, with few minor exceptions, have been greeted with approval, with the result that a close co-operation is under way. Mr. Williams is strongly of the opinion that the simple, comprehensive method is for the Secretary of Commerce to secure for his office and fully carry out the duties and responsibilities contemplated by Congress in the act of March 3, 1919, commonly known as the fourteenth census act. He states that the "very proper objections upon the part of the coal industry to pending legislation regarding the compiling and publication of statistics already provided for, will, by this method, be met and no further legislation required." The legitimate and proper safeguarding of individual business information, it is declared, would be protected. This, it is pointed out, will be accomplished "by that inviolability which protects the confidential nature of census information."

Census Act Broad

Section 32 of the fourteenth census act is interpreted to be sufficiently broad in its scope as to justify the collection and publication of all desirable statistics relating to mines and quarries by the Census office for the years 1921, 1923, 1925, and 1927.

An opinion of the Acting Solicitor of the Department of Commerce is cited to show that full protectin is accorded the activities of the Census Bureau under the biennial census. The belief is expressed that general production statistics, such as now are under discussion by the Secretary of Commerce and various interests will, when gathered by the Bureau of Census, be under the same protection.

"Our opinion, therefore, is that active endeavors should be undertaken," says Mr. Williams, "to see that these various statistical activities are fully undertaken by the Census and that all other agencies of the Government asking for statistics should be respectfully referred to the Bureau of the Census and get their information from there.

"In other words, we conclude that it is time for the business interests of the country themselves to put a stop to this indiscriminate and continuous annoyance by sundry governmental agencies asking for duplicate, or practically duplicate, statistical information."

Suggestions Requested

Employees of the Youngstown Sheet & Tube Co., Youngstown, Ohio, have been requested to offer suggestions along the following lines:

Regarding new fields for the use of the company's products, or fields not sufficiently covered at present.

Regarding improvements on present products.

To stimulate interest of employees in their work.

Regarding economies of every kind, especially office supplies.

Prevention of waste of all kinds.

Regarding the simplification of office systems, stock keeping, records, etc.

Regarding safety, fire hazards and kindred subjects.

Regarding the elimination of complaints.

Regarding anything expediting the company's business.

PERSONAL

Walter C. Lindemann, mechanical engineer A. J. Lindemann-Hoverson Co., Milwaukee, manufacturer of stoves and ranges, was elected president of the Milwaukee Engineers' Society at the annual meeting June 20. Mr. Lindemann is 34 years of age and a son of A. J. Lindemann, president of the company. He was educated at the University of Wisconsin and the Imperial Technical Highschool at Charlottenburg. Other officers are: Vice-president, Arthur Simon, Cutler-Hammer Mfg. Co.; treasurer, Albert Blatz, Jr., Standard Separator Co.; secretary, Fred H. Forner, Wells Building; directors, M. A. Beck, Milwaukee Electric Crane & Mfg. Co.; Harold Falk, general superintendent Falk Co.; Herman Schifflin, Allis-Chalmers Mfg. Co.

D. F. Hulgrave has been appointed manager of purchases for the Cadillac Motor Car Co., Detroit, to succeed J. H. Main, who has just been appointed director of the purchase section of the advisory board of the General Motors Corp., with headquarters in Detroit. Mr. Hulgrave has served 13 years with the Cadillac company, the last three as assistant to Mr. Main.

Robert Darnton, general manager, and Ernest C. Dershem, assistant sales manager Page Steel & Wire Co., Adrian, Mich., have been transferred to other departments of the American Chain Co., Mr. Darnton going to general sales offices at New York and Mr. Dershem to Pittsburgh, where he will be manager of fence sales in the Pittsburgh district.

J. M. Whipple has been appointed supply agent, with headquarters at Shreveport, La., for the Louisiana Railway & Navigation Co., this being a new addition to the purchasing department. He was formerly division storekeeper for the Missouri Pacific, with headquarters at McGehee, Ark. All division storekeepers who formerly reported to the master mechanic's office will report to Mr. Whipple.

John R. Freeman, Jr., metallurgical division, Bureau of Standards, Washington, has gone to Europe, where he will make a study of research laboratories and metallurgical plants, with a view to learning the latest foreign practice in this work. He will accompany the party of engineers who are to present the John Fritz medal to Sir Robert Hadfield.

E. D. Hand, formerly of the J. C. Wilson Co., Detroit, as vice-president and sales manager, has been appointed a member of the executive staff of the International Motor Co., New York, manufacturer of Mack trucks.

B. F. Bourne, chairman of the board of the Bourne-Fuller Co., Cleveland, sailed from New York June 25 for Europe. He will spend two months motoring through England, France and Switzerland.

Ernest M. Orr has been appointed assistant to George H. Hannum, general manager of the Oakland Motor Car Co., Pontiac, Mich.

William Aldrich, who has recently been in charge of thermit welding in the Southern territory of the Metal & Thermit Corporation, New York, has been transferred to the Western territory. He will travel in California, Oregon, Washington, Idaho, Nevada, Utah and Arizona, making his headquarters at the new South San Francisco office of the corporation. William H. Moore, recently assigned to the Chicago territory, now has charge of the Southern territory.

Henry Latshaw has resigned as secretary and director of the Allegheny Steel & Tube Co., Inc., and is not at this time actively connected with the company in any way.

F. L. Estep, Perin & Marshall, New York, has returned from a trip to England and France, having left New York on April 23 to meet C. P. Perin in London. S. M. Marshall is returning from India via the Pacific, being due in San Francisco on July 5.

Prof. Robert Peele, Columbia University School of Mines, has been elected an honorary member of the Institution of Mining and Metallurgy, London, "in recognition of his eminent services in the advancement of mining, science and education."

J. G. White has been appointed district sales manager at Detroit for the Sharon Pressed Steel Co., Sharon, Pa. From his office at 1214 Dime Bank Building, Mr. White will direct the service on Sharon frames to the motor car and truck industry.

A. R. Knowlton recently joined the selling force of J. S. Morrison Co., Oliver Building, Pittsburgh, handling a general line of forgings and castings, specializing particularly on rolled, forged and cast manganese steel.

George H. Lambkin, who has been with William J. Cullen, New York, for a number of years, giving special attention to the various lines of the Sterling Wheelbarrow Co., has resigned.

Thomas W. Warner, president and general manager Chevrolet Motor Co., Toledo, Ohio, and of the Muncie Products Co., Muncie, Ind., has resigned to become vice-president of Durant Motors, Inc. He retains his interests in the General Motors Corporation.

Maurice Goudrys has assumed his duties as general manager of the Cortland Grinding Wheel Corporation, Chester, Mass. He formerly was with the Pike Mfg. Co., Pike, N. H.

N. P. Hyndman, sales agent Washington Coal & Coke Co., Pittsburgh, has been elected a member of the board of directors of that company, succeeding the late W. Harry Brown.

OBITUARY

FREDERICK LOTHROP AMES, Boston and North Easton, Mass., son of Frederick L. Ames, founder of the Ames shovel-making concern, died last week at his country estate. He was born at North Easton, July 23, 1876. Among the various manufacturing companies with which he was associated was the Fess Rotary Oil Burner, Inc., Boston. He recently underwent an operation for appendicitis, following which complications set in.

CHARLES D. F. BRUNE, purchasing agent, York Safe & Lock Co., York, Pa., died June 18.

CAPT. ROBERT B. LANG, founder and president R. B. Lang Mfg. Co., Racine, Wis., manufacturer of hardware specialties, sheet metal stampings, nickel plating, etc., died June 22 at the age of 77 years.

CHARLES E. GEIGER, aged 64, president of Geiger, Fisk & Koop, operators of the Louisville Drying Machine Co., manufacturer of textile and other drying machinery at Louisville, died on June 18. He was born in Germany, but had been a resident of Louisville for 40 years.

GEORGE A. BAIRD died at Chicago on June 21 at the age of 56. He started as a telegraph operator in Sharon, Pa., where he later became associated with Peter Kimberly in the mining and mill business. Subsequently he became identified with the Republic Iron & Steel Co. when it was organized, remaining with that corporation until 1905, when he was vice-president and general sales manager. Since that time, he devoted his attention to handling the Kimberly estate, with headquarters at Chicago.

Employees of the Chicago, North Shore & Milwaukee Railroad, an electric line running from Chicago to Milwaukee, have voted in favor of a reduction of wages to become effective June 16 last. The reductions will average around 12 to 15 per cent and will affect 1500 employees from the president down.

IRON AND INDUSTRIAL STOCKS

Sentiment in Financial Circles Appears to Have Changed for the Better

Sentiment in financial circles appears to have changed for the better the past few days—based on just what is not quite clear. Money is easier, it is true, but this phase of the situation has been growing more and more comfortable for some time. Possibly large frozen credits have been liquidated, thereby relieving the strain. Whatever the cause, the change in financial sentiment is reflected in the movement of prices for securities, following additional new low quotations for 1921, established earlier in the week. In not a few instances, very substantial price recoveries are noted, particularly in the railroad equipment group. The decrease in the number of idle cars indirectly is associated with higher quotations for stocks. It is more evident each week the railroads are sadly in need of all kinds of equipment.

Steel stocks have recovered some of the ground previously lost, but the rebound is somewhat tempered by the continued uncertainty regarding prices and business. Investors, in some cases, are inclined to look on the slightly better buying of pig iron as a forerunner of a partial revival in the steel industry sooner than most people anticipate. Evidence is at hand that the automobile industry will do better this summer than was thought possible a month ago. The record May output by the Ford company indicates the demand for low-priced cars, at least, is by no means exhausted. All of which explains in part the better character of recent buying of automobile shares. The copper metal market is working around, although very slowly, and people who sold securities some time back have reinvested.

The range of prices on active iron and industrial stocks from Saturday of last week to Monday of this week was as follows:

Allis-Chalm. com.	29 - 32	Int. Har. pf.	99¼-100
Allis-Chalm. pf.	69¾ - 70¾	Lackawanna Steel.	32 - 36
Am. Can com.	23½ - 26⅛	Midvale Steel.	22⅛ - 23⅛
Am. Can pf.	76¾ - 78¾	Nat.-Acme	13⅝ - 15¼
Am. C. & F. com.	115½-120½	Nat. E. & S. com.	41 - 47¼
Am. C. & F. pf.	108 -109	N. Y. Air Brake.	55 - 57¼
Am. Loco. com.	73½ - 79	Nova Scotia Steel.	21½ - 22
Am. Loco. pf.	— - 98¼	Press. Steel com.	64 - 66½
Am. Radiator com.	— - 69	Press. Steel pf.	— - 83
Am. Steel F. com.	24 - 26	Ry. Stl. Spg. com.	73½ - 76½
Am. Steel F. pf.	— - 82	Ry. Stl. Spg. pf.	— - 98⅝
Bald. Loco. com.	62¼ - 70	Replogle Steel.	18 - 20¼
Bald. Loco. pf.	95⅛ - 97	Republic com.	41⅛ - 46⅝
Beth. Steel com.	39½ - 42	Republic pf.	79⅞ - 81¾
Beth. Stl., Cl. B.	41½ - 48¾	Sloss com.	32¼ - 35
Beth. St., 8% pf.	93¾ - 97	Superior Steel.	26 - 27
Chic. Pneu. Tool.	50 - 55	Transue-Williams.	28 - 29¼
Colorado Fuel.	26 - 27¾	Un. Alloy Steel.	19 - 21¼
Cruc. Steel com.	51½ - 57⅝	U. S. Pipe com.	12½ - 14
Cruc. Steel pf.	— - 75	U. S. Steel com.	70¼ - 73⅞
General Electric.	120½-127	U. S. Steel pf.	105 -106
Gt. No. Ore Cert.	25⅝ - 27	Vanadium Steel.	25¼ - 28
Gulf States Steel.	25 - 29½	Westingh'se Elec.	41⅞ - 44¼
Int. Har. com.	78⅛ - 84		

Huron Steel Co. Bankrupt

The Huron Steel Co., Cleveland, has been placed in the hands of Frank Mooney, attorney, receiver, as a result of the filing of involuntary bankruptcy proceedings in the federal court. The company, formerly named the Universal Steel Co., had planned to build a mill in Huron, Ohio, for the manufacture of pipe, bars, billets, ske'p and other products. The company has been conducting a stock selling campaign for some time.

Low Prices for Stocks

YOUNGSTOWN, OHIO, June 28.—Declines in standard industrial stocks have taken place here recently, eclipsing to some extent such movements on the New York market.

One steel common, subdivided into non-par value shares, sold recently on a basis of $84 for the old stock, as compared with a high during the war of $235.

Another sold at $210, as compared with a high point during the war of $375, while still another sold at $75, is down from a war high of $175.

The last sale on Brier Hill Steel Co. common was $14; common stock of the Youngstown Sheet & Tube Co., $44.75, and Trumbull Steel Co. common, $16. Preferred issues of all three industrials are off from four to five points.

A block of the common stock of the United Engineering & Foundry Co. sold at $157, a decline of 20 points from the previous sale.

These developments reflect both the industrial situation and the state of the investment market.

Industrial Finances

At the trustee's auction of the property of the bankrupt Monarch Tractor Co. of Watertown, Wis., E. D. Caldwell of New York bid in the buildings, equipment, material, etc., for $44,000. The city of Watertown carried the property on the assessment roll this year at a valuation of $168,000. Appraisers in bankruptcy placed the valuation at $40,000. Mr. Caldwell is a principal stockholder as well as a large creditor of the General Tractors, Inc., Paulsboro, N. J., which owns the Monarch Tractor Co., and with it became defendant in involuntary bankruptcy proceedings a short time ago.

The Universal Machine Co., Bowling Green, Ohio, has increased its capital stock from $1,250,000 to $1,500,000.

The Security Trust Co., Detroit, has been appointed receiver for the Wright-Fisher Bushing Corporation, recently adjudicated bankrupt. The corporation was preparing to locate a plant of its own at Holly, Mich., when bankruptcy proceedings were instituted.

The plant of the M. M. A. Sweeney Shipyard & Foundry Co., Jeffersonville, Ind., has been sold in a foreclosure proceeding, to the First National Bank, of Louisville, Ky., for $20,000. Two judgments had been given against the company for more than $50,000 to two trust companies and there are numerous other creditors.

Directors of the General Fireproofing Co., Youngstown, Ohio, have declared a dividend of 1 per cent on the common stock and 1¾ on the preferred, both payable July 1 to holders of record June 20. The company has heretofore paid 1¾ per cent on the common. It has $1,500,000 of common outstanding and $1,350,000 of preferred.

C. H. Booth, director of the Youngstown Sheet & Tube Co., Youngstown, Ohio, and formerly chairman of the board of directors of the United Engineering & Foundry Co., Pittsburgh, has been appointed receiver for the Republic Rubber Corporation, Youngstown, Ohio. Reorganization of the company so as to maintain operations is the aim of the receiver. It manufactures tires, rubber hose and belting widely used by the railroads and many steel companies.

Directors of the Falcon Steel Co., Niles, Ohio, have declared the regular quarterly dividends of 2 per cent on the common stock and 1¾ per cent on the preferred, both payable July 1 to stock of record June 20. The payments will be made from surplus, as low prices and reduced earnings prevented the company from showing net earnings for the quarter. During eight months' operations in 1920, the company earned $880,000, after paying dividends and all charges. It has $1,000,000 of common stock issued and $1,250,000 of preferred.

In the second quarter of 1921, the Newton Steel Co., Youngstown, Ohio, earned in excess of its preferred dividend requirements, after all other charges. For a considerable period, the company's finishing mills at New Falls, Ohio, have been running virtually full. Its output consists largely of automobile sheets. An official states business in hand is sufficient to maintain capacity production for a month or more.

The St. Louis Coke & Chemical Co., St. Louis, an interest of the National Enameling & Stamping Co., St. Louis, has arranged for a bond issue of $10,000,000, the proceeds to be used for the completion of a new plant, general operations, financing, etc.

On petition of the Riter-Conley Co., Pittsburgh, an interest of the McClintic-Marshall Co. of that city, the Federal Court at Boston ordered the appointment of Daniel A. Shea, former Assistant United States District Attorney, as receiver for the Bay State Refining Co.

Directors of the Youngstown Sheet & Tube Co., June 14, declared a dividend of 50c. per share on the non-par value common and the regular of $1.75 on preferred, both payable July 1 to stock of record June 20. On April 1 the company paid $1 per share on common and on Jan. 1 paid $1.50.

The Motor Wheel Corporation, Lansing, Mich., on June 20 paid a cash dividend on common stock of 2 per cent, the same percentage having been paid quarterly since the company's organization.

The Fischer & Hayes Rope & Steel Co., 741 West Van Buren Street, Chicago, manufacturer of wire rope, etc., has increased its capital from $30,000 to $150,000, with 1500 shares of common stock, no par value.

The Canton Cutlery Co., Canton, Ohio, has filed notice of increase in its capital from $50,000 to $200,000.

A committee of the first preferred stockholders of the Moline Plow Co. has issued a circular stating that, as a result of unsatisfactory business conditions in 1920 and so far this year, it is probable that the company will be unable to pay the $1,000,000 principal amount of its 7 per cent notes, series C, maturing in September or the interest due then on $4,000,000 notes outstanding.

Machinery Markets and News of the Works

BUYING POSTPONED

Many Prospective Buyers Put Off Placing of Orders

June the Worst Month of the Year in Point of Machine-Tool Sales

Postponements are being made by even the small number of machine-tool users whose inquiries have been before the trade recently. Uncertainty as to the future, rather than prices, seems to be the factor which has placed many fairly promising prospects on the inactive list.

June sales were the smallest of any month this year, according to reports from leading market centers. A single exception is Cincinnati, where a few fairly good orders turned the balance slightly in favor of the month of June as compared with the month of May.

Some of the railroad inquiries, which were expected to close this month, are still pending. The Illinois Central, Rock Island, Big Four and other roads were about to buy, but action has been repeatedly deferred.

An increasing number of used machines are on the market. One large Middle Western machine-tool builder is offering for sale a fair share of its own equipment, consisting not only of its own tools, but those of other builders. Used tools are being offered at close to one-half of the prices of new machines.

Among the inducements offered for machine-tool orders by builders and dealers are long-time credits. An extreme instance is 12 months' time in which to pay for a single machine.

The Navy Department has taken bids on a considerable number of precision lathes, of which 19 are for the Newport, R. I., torpedo station.

New York

NEW YORK, June 28.

Unusual inducements in the way of credit terms are being offered by machine-tool builders and dealers to get orders. In some instances prospective buyers have been given from six months to a year to pay for machines, instead of the customary "cash in 30 days." While in individual cases the offering of long-time credit has been resultful, the volume of business has not been increased materially by such concessions. There continues to be a scarcity of both inquiries and orders. Sales are confined almost wholly to single tools. A dealer who received a $13,000 order last week counted that as one of the best bits of business done in several weeks.

One of the most important contracts placed in this district the past week was given to the Surface Combustion Co., Inc., 366 Gerard Avenue, Bronx, New York, by the International Nickel Co., 67 Wall Street, and consisted of two sheet, two pair and six annealing furnaces to be fired by the Surface Combustion process and to be installed in the International Nickel Co.'s new plant at Huntington, W. Va. Frank I. Ellis, 2126 Farmers' Bank Building, Pittsburgh, is the consulting engineer for this plant, acting through W. L. Wotherspoon, chief engineer of the International Nickel Co.

Some slight activity appeared in the crane market the past week in old inquiries, several of which may close within the next week. The inquiry of the Porcupine Co., Bridgeport, Conn., calls for one 15-ton, 80-ft. span crane, three 5-ton assembling cranes and repair work on three other assembling cranes. The American Sugar Refining Co. is receiving bids on four 3-trolley, 7-motor, 25-ft. 2-in. span cranes capable of handling seven 325-lb. bags of sugar on each trolley. The National Power Machine Co., Cleveland, a dealer, has requested offers of a 10 or 15-ton, 35 to 40-ft. boom locomotive crane, equipped with 1-yd. bucket and hook. An export inquiry from Japan which includes a 200-ton overhead traveling crane, is being handled by Okura & Co., New York. The crane of 350 gross tons capacity for the Indian Head proving grounds, tenders for which were recently issued by the Government, has been postponed indefinitely.

Among recent sales are: Shepard Electric Crane & Hoist Co., one 5-ton, 70-ft. span and one 10-ton, 70-ft. span equipped with two 5-ton trolleys to Austin Brothers, Inc., Atlanta, Ga.; Chisholm-Moore Mfg. Co., a 1-ton underslung, hand power crane to the Crane Co., 490 Cherry Street, New York; Maris Brothers, two 10-ton overhead traveling cranes to the Nairn Linoleum Co., Arlington, N. J.

The A. C. Chesley Co., Inc., 277 Rider Avenue, New York, manufacturer of metallic fireproof doors and windows, has acquired eight city lots on East 132d Street for an addition to its plant.

A power plant, machine shop and automobile service works will be constructed by the Willow Brook Dairy Co., 5 South Fulton Street, Mt. Vernon, N. Y., in connection with its proposed new plant, estimated to cost about $250,000. The McCormick Co., Century Building, Pittsburgh, is architect and engineer.

The Kimbro-Rayburn Corporation, New York, has been incorporated with a capital of $225,000 by J. W. Kimbro, S. C. Berry and J. Hennies, to manufacture lawn mowers and parts. It is represented by T. F. VonDorn, 141 Broadway.

The New York Edison Co., 130 East Fifteenth Street, New York, is having plans prepared for a two-story addition to its power house at 10-12 Elizabeth Street. William Whitehill, 12 Elm Street, is engineer.

A new switching plant, 63 x 94 ft., estimated to cost about $125,000 with equipment, will be erected by the New Amsterdam Gas Co., 132 East Fifteenth Street, at 401 East Fortieth Street. William Whitehill, 12 Elm Street, is engineer.

Samuel E. Bernstein, Inc., New York, has been incorporated with a capital of $300,000 by P. J., M., and Samuel E. Bernstein, 106 Fifth Avenue, to manufacture cutlery and kindred products.

Fire, June 19, destroyed a portion of the plant of the Samuel Uris Iron Works, Gerard Avenue and 157th Street, New York, with loss estimated at about $25,000.

The Wilart Instrument Co., 13 Rose Street, New Rochelle, N. Y., has completed plans for a new two-story and basement plant on Huguenot Street, 70 x 250 ft., estimated to cost about $60,000. William Nelson is president.

H. H. Rickard, 117 Sterling Place, Brooklyn, manufacturer of automobile tops and kindred equipment, has acquired property at 355-57 Butler Street, 57 x 100 ft., with one-story building on the site, which will be remodeled and improved.

The Brooklyn Rapid Transit Co., 85 Clinton Street, Brooklyn, has been granted permission by the Transit Commission to issue receiver's certificates in an amount of $3,000,000 for equipment, operations, etc. Lindley M. Garrison is receiver.

The Lamp Salvage Corporation of America, Inc., New York, has been incorporated with a capital of $500,000 to manufacture lighting and heating appliances and equipment. It is represented by Arthur W. Britton, 65 Cedar Street.

The Johnston Arms Co., Passaic, N. J., has been organized by James S. Johnston and Edward T. Moore, 225 Main Avenue, to manufacture firearms.

In connection with the new dirigible hangar at Lakehurst, N. J., now being erected by the Bureau of Yards and Docks, Washington, complete machine shop and repair facilities will be provided, including five monorail cranes supporting movable platforms in the hangar. The structure will be 264 x 803 ft., and 195 ft. high.

The King Tool Co., Asbury Park, N. J., has been incorporated with a capital of $100,000 by A. C. Klopper, Joseph

Pilling and Joseph C. Tynan, Mattison Avenue, to manufacture tools and other mechanical equipment.

In connection with the installation of a new high pressure water system, the Board of Aldermen, Boonton, N. J., is planning for the construction of a new pumping plant for operation. The entire installation, as recommended by Frederick V. Pitney, Morristown, N. J., engineer for the town, is estimated to cost $85,000.

The Kerwin Mfg. Co., Plainfield, N. J., has been incorporated with a capital of $25,000 by Charles T. Woodruff, William B. Mead and Lawrence Kerwin, Rock Avenue, to manufacture universal joints and other mechanical products.

The Vreeland Motor Co., Chestnut Avenue, Irvington, N. J., manufacturer of automobile trucks, will commence the immediate erection of the first unit of its new plant on Coit Street, estimated to cost in excess of $300,000. John T. Simpson, Essex Building, is architect.

The Essex Metal Ceiling Co., Newark, has been incorporated with a capital of $50,000 by George and Aaron Herr, 584 Bergen Street, to manufacture metal ceilings and kindred products.

The Kane Tinware Co., 293 West Kinney Street, Newark, has filed notice of organization to manufacture tin and galvanized metal products. A. M. Kane, 195 Spruce Street, heads the company.

The Ferguson-Herber Corporation, Hoboken, N. J., has been incorporated with a capital of $100,000 by Frederick D. Herbert, Cottrell C. Wheeler and John Ferguson, 1132 Clinton Street, to manufacture machinery.

The Citizen Radio Co., 111 Third Street, Newark, has filed notice of organization to manufacture wireless equipment. Edward W. Hain heads the company.

New England

BOSTON, June 27.

June will pass out as the quietest month experienced this year by a majority of local machine tool houses. The trade, however, is inclined to take a more hopeful view for July, presumably on expectations of closing deals hanging fire for many weeks. One leading machinery interest this week reports sales aggregating half a dozen tools of various kinds. The auction sale problem still confronts the market for new equipment. On June 30 J. E. Conant & Co., Lowell, Mass., will conduct a public sale at the plant of the Iverson Piano Player Co., Worcester, Mass., at which bids will be asked on bench precision lathes, hand screw machines, speed lathes, hand millers, milling machines, sensitive drills, gear shapers, grinders, power presses, screw cutting engine lathes, spur gear cutters, shears, saws, blowers, motors, trucks, wood-working machinery and other miscellaneous equipment.

Bids have been opened at Washington, on a fairly large number of precision lathes, 19 of which are for the Newport Torpedo Station, Newport, R. I. A Waltham, Mass., lathe maker is reported as the low bidder. At the Torpedo Station, bids were opened this week on a limited amount of metal-working equipment, most of it above the appropriation. The Sebastian Lathe Co. and the Fairbanks Co., were low bidders for the two lathes, and the Gisholt Machine Co. for the boring mill. Approximately $400 worth of small tools was awarded a Boston dealer. A Providence, R. I., machine builder reports the sale of a swaging machine costing more than $9,000. The Maine Central Railroad Co. is in the market for a small lathe, shaper and an upright drill, and the Amoskeag Mfg. Co., Boston, is asking bids on a 60-ton crane. The Lowell Dye Works, Lowell, Mass., has bought power hack saw equipment. Large press business has been turned down by local dealers due to terms on which prospective customers wished to place orders.

The demand for wood-working machinery is decidedly better. A sizable purchase in connection with the Jewish back to Palestine movement was closed here this week. In connection with this movement it is interesting to note that a large amount of agricultural machinery has been purchased, additional wood-working equipment will be taken on, English interests will construct railroads, repair shops, etc., and it is planned eventually to buy many thousand dollars worth of metal-working equipment. Quotations will also be asked in the near future on a small amount of machine tools for repair work, as well as forges, anvils, etc.

The equipment for two Manchester, N. H., school machine shops, lists for which are issued, will be placed through the Fred T. Ley Co., Springfield, Mass.

A material reduction in prices on carbon and high speed drills is announced and most kinds of reamers also are cheaper. There has been a revamping of resale prices on Jacob chucks.

Blacksmith supplies are in better demand than at any time this year.

A Massachusetts charter has been given the Freeman Sheet Metal Works, 216 Columbia Road, Dorchester, Boston, Isadore Freeman, 521 Warren Avenue, Brockton, is president, and David Baltimore, 12 Bower Street, Roxbury, treasurer.

The G. H. P. Mfg. Co., manufacturer of light machinery, tools, gages, jigs, fixtures, etc., formerly at 128 North Main Street, Providence, R. I., has moved to Woonsocket, R. I., where it has larger and better quarters.

Charles F. Spellman, 31 Elm Street, is president, and Chester C. Jackman, 134 Princeton Street, vice-president and treasurer of the Dohnan Mfg. Co., Inc., Springfield, recently granted a Massachusetts charter. It is capitalized for $40,000.

Contract has been let by the Hart & Cooley Mfg. Co., New Britain, Conn., wrought registers, etc., for a one-story, 39 x 50 ft. boiler house to replace the one destroyed by fire several months ago. This work does not involve any plant expansion.

The International Steel Toy Co., Boston, is located for the present at 7 Water Street, room 309, where it will remain until such time as its dies are completed, when manufacturing space will be obtained in the business section of the city. L. A. Charlton is president.

The Atlas Safety Equipment Co., Boston, capitalized for $100,000 in preferred stock and 500 shares common stock of no par value, has taken out a Massachusetts charter to manufacture hardware. Francis J. Roche, 46 Paulina Street, Somerville, is president and treasurer and Bart J. Sullivan, Portland, Me., vice-president.

George Croak, formerly with the Framingham Foundries, Framingham, Mass., and the Becker Milling Machine Co., Hyde Park, Boston, and recently with the Athol Machine Co., Athol, Mass., has taken over the foundry built last fall for the M. P. Brundige Co., Inc., 137 Willes Avenue, Dorchester, Boston, and will operate it as the George Croak Foundry Co. It has a daily capacity of about 10 tons.

The Ansonia Electrical Co., Main Street, Ansonia, Conn., manufacturer of electric burglar alarms and other electrical equipment, is taking bids for a two-story, brick and steel addition, 60 x 200 ft., estimated to cost close to $200,000 with equipment. Fletcher-Thompson, Inc., 542 Fairfield Avenue, Bridgeport, Conn., is architect and engineer.

The Lunt-Moss Corporation, Boston, has been incorporated with a capital of $50,000, to manufacture tools and machinery. James W. Moss, 43 South Market Street, is president and treasurer; Benjamin F. Levy and L. H. White are directors.

Tempest C. Garbutt, 351 Chestnut Hill Avenue, Brookline, Mass., and associates, have organized the Fowler Co., to operate a plant at Worcester, Mass., for the manufacture of hardware products.

Edward T. Davis, 398 Bridge Street, Springfield, Mass., has awarded a contract to Edward Radding, 258½ Main Street, for a two-story automobile service and repair works, 72 x 180 ft., at Chestnut and Taylor streets, to cost about $120,000. John W. Foster, 38 Stockman Street, is architect.

The Stafford Co., 5 Colt Street, Paterson, N. J., with branch at Boston, has been incorporated under Massachusetts laws, with capital of $1,500,000, to manufacture textile machinery and parts. The incorporators are Clifford H. Walker, Allison G. Gatheron, and Joseph R. Watkins, Marblehead, Mass.

Fire, June 20, destroyed the engine house and shops of the Boston & Maine Railroad Co., Boston, at Portsmouth, N. H., with loss reported at $150,000, including equipment.

The East Boston Electric Welding Co., East Boston, has filed notice of organization to operate a machine and welding works at 85-87 Border Street. Edward Lundberg heads the company.

The Bath Iron Works, Bath, Me., has submitted a low bid to the Lighthouse Service of the Department of Commerce, Washington, for the construction of five vessels at a cost of $920,000, or $184,000 each, a rate of $347 per construction weight ton. The contract will be let at an early date on this price.

The Springfield Bronze Co., Inc., Springfield, Mass., has taken out a permit for the erection of a one-story foundry at 66 Charles Street, to cost about $10,000. Joseph R. Gould is president and treasurer.

The Industrial Lock-Nut Co., Worcester, Mass., recently organized, has taken over the Industrial Mfg. Corporation, manufacturer of self-locking nuts, and in the future will operate the plant and business. It is planned to extend production to include special lock-nuts for motor car service and other automotive equipment. Napoleon R. Thibert, 2 Heard Street, general manager of the absorbed company, will be president of the new organization. George P. Newton and Ernest P. Cotton are directors.

The Narragansett Electric Lighting Co., Turks Head

Building, Providence, R. I., has rejected bids for a new power house and machine and service building, two stories, 114 x 172 ft., estimated to cost approximately $200,000, and the project will be held in abeyance. Jenks & Ballou, Grosvenor Building, are architects.

The Gardner Storage Battery Co., Dartmouth, Mass., is having plans prepared for the erection of a one-story factory, 50 x 100 ft., for battery construction and repair, estimated to cost about $12,000.

The Automobile Body & Radiator Works, 29 Federal Street, Providence, R. I., has filed notice of organization to manufacture automobile bodies, radiators and kindred products. Domenico Troiano, 67 Crary Street, heads the company.

Machine and mechanical equipment will be installed in the new two-story and basement vocational school, 90 x 140 ft., to be erected by the Board of Education, Southbridge, Mass., estimated to cost about $200,000. Appleton & Stearns, Boston, are architects.

Buffalo

BUFFALO, June 27.

Bids will be asked within the next week for the erection of the proposed new plant of the Meldrum-Gabrielson Corporation, Syracuse, N. Y. It will be two stories, 75 x 140 ft., and equipped for the manufacture of machinery. Carl Wolter, 422 Weiting Building, architect, is in charge.

O. S. Sleeper & Co., Buffalo, N. Y., recently organized, are operating a new local plant for the manufacture of machinery for chemical service. O. S. Sleeper, formerly chief engineer of the Buffalo Foundry & Machine Co., is head.

Leo Kuznicki, 322 Cable Street, Buffalo, has made application for permission to establish a new machine shop and repair works for motorcycle and bicycle construction and repair.

The Stay New Filter Corporation, Rochester, N. Y., has been incorporated with a capital of $100,000 by W. F. and L. L. Dollinger, and J. J. McInerney, Insurance Building, to manufacture air filters for automobile service.

The Tool Bit Specialty Co., Syracuse, N. Y., has been incorporated with a capital of $50,000 by J. B. Dunlop, W. J. Salmon and C. G. Strodel, to manufacture braces, bits and other tools. J. F. Nash, attorney, Syracuse, is corporate representative.

The Service Parts Co., Syracuse, N. Y., has been organized by G. K. Sutphen and F. H. Spangle, Fulton, N. Y., to manufacture automobile parts.

The Cambria Power Co., Sanborn, Niagara County, N. Y., has been incorporated with a capital of $100,000 by J. A. Duff, R. E. Casselman and G. G. Mattern, Kenmore, N. Y., to establish and operate a local electric power plant.

The plant of the National Roofing Co., Tonawanda, N. Y., was damaged by fire June 19 with loss of $40,000 to building and machinery.

The Buffalo Shock Absorber Co. has incorporated for $50,000 to manufacture shock absorbers. Frank A. Abbott, Iroquois Building, Buffalo, represents the company.

Chicago

CHICAGO, June 27.

Although there has been a little more buying the past week, it is probable that June sales will be the smallest of any month thus far this year. Recent activity has been confined largely to the sale of individual tools, one machinery house reporting that it had sold a 20-in. x 14-in. engine lathe, two good-sized floor stand two-wheel grinders, a radial drill and a disk grinder. Probably the largest single purchase was 39 punch presses bought by the Automatic Electric Co., Chicago, and representing a total outlay of about $16,000. Industries in this section are still operating on a part time basis or are entirely idle. One of the most favorable local developments is the fact that a number of tool and die manufacturers have work in their shops for the first time since October. The Illinois Central and Rock Island railroads have not yet taken action on their inquries, but the latter line has added two machines to the small list which has been before the trade for several weeks. These are an 18-in. x 10-ft. engine lathe and a double punch and shear with 24-in. throat, capacity to punch ½-in. hole in ½-in. plate and to shear 1¾-in. rounds and ⅞-in. plates.

The Great Northern Railway, an inquiry from which was published in THE IRON AGE of June 2, has purchased the following tools involving about $25,000: One 48-in. double end punch and shear with motor; 15-in. x 8-in. planer and matcher with motor; 18-in. x 12-in. four-side timber sizer with motor; 30-in. pattern maker's disk grinder; a No. 2 reversible air motor; two No. 2 Bridgeport belt-driven floor grinders; 42-in. upright drill press, a journal box boring machine; two 24-in. belt-driven sliding head drills, a foundry riddle and an arc welding machine.

There are few inquiries in the market and most of them are for single machines and ask for figures on both new and second-hand equipment. The Rancke Mfg. Co., Hinsdale, Ill., is in the market for a No. P 5 Ferracute 70-ton press. The Interstate Iron & Steel Co. wants a No. 5½ Merrell combined hand and power pipe machine or equivalent.

The Sheet Metal Construction Co., 2019 Laflin Street, Chicago, has let a contract for the construction of a two-story shop, 50 x 80 ft., 2634-36 West Twenty-sixth Street, to cost $20,000.

The International Harvester Co., 606 South Michigan Avenue, Chicago, has let a contract for a one-story addition to its annealing and gas producer building, 27 x 65 ft., Thirty-first Street west of Western Avenue, to cost $6,500.

The Acme Motion Picture Projector Co., 1134 West Austin Avenue, Chicago, has purchased the property, 50 x 120 ft., at the northwest corner of Austin Avenue and May Street, and will erect a three-story factory and warehouse to replace the present two-story structure. The new plant will contain 18,000 sq. ft. of floor space and will enable the company to double its output. It will cost $90,000 and work will begin within 30 days.

A bill to dissolve the Kankakee Automobile Co. Kankakee, Ill., to appoint a receiver, and enforce the liability of the directors and stockholders was recently filed in the circuit court in that city by the Maynard Steel Castings Co. and others. It is alleged that the Kankakee company frequently violated the laws of the State and that it was never developed beyond the promotion stage.

The Duty Motor Corporation, Greenville, Ill., plans to enlarge its manufacturing facilities. A new building, 250 x 250 ft., to cost $75,000, is contemplated.

Business men of Houghton and Hancock, Mich., plan to reopen the Carroll foundry, Houghton, which has been idle following a fire about seven years ago. Among those interested in the project is James Carroll, one of the members of the old firm which operated the plant.

The American Car & Foundry Co., according to a report from Jeffersonville, Ind., plans to start work soon on the construction of a blacksmith shop and a new machine shop in that city.

The Pendergast Fence Co., now operating plants at Stillwater, Minn., Fort Madison, Iowa, and Owen Sound, Canada, is negotiating for a plant site in Elkhart, Ind.

Work has started on the conversion of the lower boiler house at the Manufacturers' Terminal, Waukegan, Ill., into a foundry building for the Waukegan Foundry Co., the organization of which was recently announced in this column. The foundry will produce gray iron and semi-steel castings and orders have been already placed for an 8-ton Whiting cupola and an air compressor.

The Miller-Bryan & Pierce Co., 225 River Street, Aurora, Ill., manufacturer of typewriter supplies, has let a contract for a three-story factory, 60 x 150 ft., to cost $60,000.

The Paragon Foundry Co., Oregon, Ill., is having plans drawn for a one-story foundry, 100 x 200 ft., to cost $50,000.

The Kremer Motor Co., 1518 Hennepin Avenue, Minneapolis, will soon let contract for a two-story garage, 50 x 150 ft., 1411 Yale Place, to cost $70,000.

The Baker Ice Machine Co., Omaha, Neb., is building a $250,000 plant near Sixteenth and Evans streets.

The Dixon Mfg. Co., a combination of the Chatsworth Mfg. Co. and the Engineering Sales Co. of Chatsworth, Ill., has taken an option on property in Dixon, Ill., and is asking bids on a one-story plant, 50 x 200 ft. It manufactures sheet metal and water supplies.

The Lorenzen Mower Co. has broken ground in LeClaire, Iowa, for a mower factory, 60 x 120 ft.

The Economy Machine Products Co., 4755 London Avenue, Chicago, is taking bids for the erection of a new one-story plant, 50 x 100 ft., on Lawrence Street, to cost about $21,000.

The Illinois Central Railroad, 135 East Eleventh Place, Chicago, has plans under way for new locomotive repair shops and engine house at Herrin, Ill., to cost about $200,000 with equipment.

The D. & M. Auto Lock Co., 2132 Lawrence Avenue,

Chicago, has been incorporated with a capital of $150,000 by John P. Dales, M. J. Meyers and M. E. Daniels, to manufacture locks and locking devices for automobile service.

The McLelland Electric Bake Oven Corporation, 36 South State Street, Chicago, has been incorporated with a capital of $100,000 by William H. McLelland, Charles E. Weadley and Julius Slora, to manufacture electrically operated ovens and appurtenances.

The Common Council, Willmar, Minn., has preliminary plans under way for the erection of a municipal electric light and power plant to cost about $45,000. H. Gunderson is clerk.

The Southern Alberta Refineries, Ltd., Calgary, Alberta, has acquired property at Winnett, Mont., heretofore held by W. J. Winnett, for the erection of a new oil refinery to cost about $100,000. The initial plant will be enlarged at an early date. William Livingston is president.

Fire, June 17, destroyed the pattern shop and other works department of the McDaugall-Duluth Pattern Shop, and destroyed the plant of the Minnesota Match Co., adjoining, West Duluth, Minn., with total loss, including machinery, estimated at $125,000.

McCord & Co., 122 South Michigan Avenue, Chicago, manufacturer of railroad supplies, castings, etc., has placed its two plants at West Pullman, Chicago, on the market. The largest plant will be disposed of with complete equipment now installed for the manufacture of iron castings, pressed steel specialties, etc. The smaller plant will be sold without equipment.

The Miller, Bryan & Pierce Co., Aurora, Ill., manufacturer of typewriter supplies, etc., has awarded a contract to W. H. Graham, Aurora, for the erection of a three-story and basement addition, 60 x 150 ft., estimated to cost about $60,000. Lockwood, Greene & Co., 38 South Dearborn Street, Chicago, are architects and engineers.

Philadelphia

PHILADELPHIA, June 27.

The Thompson-Levering Co., 327 Arch Street, Philadelphia, manufacturer of measuring instruments, has completed foundation work for its new two-story and basement plant, 60 x 80 ft., at Westminster Avenue and Fifty-seventh Street, and will commence erection of superstructure at once. It will cost in excess of $60,000.

A. Sharp, 5320 Baltimore Street, Philadelphia, has filed plans for a one-story addition to his machine shop at Fifty-third and Broomall streets.

The Paul E. Flotron Co., Philadelphia, Pa., has been incorporated with a capital of $50,000 to manufacture ice-making and refrigerating machinery. Paul E. Flotron, 207 North Thirty-fifth Street, is treasurer.

The Bridesburg Foundry & Engineering Co., Philadelphia, has been incorporated with a capital of $125,000 to manufacture machinery, castings, etc. It is represented by Wray C. Arnold, Commonwealth Building.

Morris Jones, Inc., Philadelphia, is being organized by Morris Jones and John Weaver, Commercial Trust Building, to manufacture automobile engines and other automotive equipment. Application for a State charter will be made on July 20.

Frank P. Florentine, Park Avenue, Philadelphia, has awarded a contract to the Stewart Brothers Co., 2526 North Orkney Street, for a new one-story machine shop on Park Avenue.

The Division of Supply and Sales, United States Shipping Board, Nineteenth and B streets, N. W., Washington, is taking bids up to July 26 for tonnages of angles, bars, channels, plates and other structural material now at the Hog Island Shipyard, Philadelphia. The total disposition will aggregate 110,000 tons.

Plans are being prepared by W. E. S. Dyer, engineer, Land Title Building, Philadelphia, for a new power plant at the works of the Enterprise Furniture Co., Philadelphia.

The Merchant Shipbuilding Corporation, Harriman, Pa., is reported to be in negotiation with the United States Shipping Board, Washington, for the acquisition of the plant and site now occupied. The company holds the land, while the Government constructed and owns the building. The site is held at $1,300,000, and the Shipping Board has had options to purchase. The Navy Department has awarded a contract to the company for the construction of two 600-ft. structural steel towers for the Naval Academy wireless station at Annapolis, Md. The work will be carried out in the new structural department at the Chester, Pa., yard, recently established.

Creditors of the Trent Rubber Co., Enterprise Avenue, Trenton, N. J., manufacturer of automobile tires and tubes, have acquired the property at a receiver's sale for about $100,000. The creditors' organization, headed by Edgar W. Hunt, will continue the operation of the plant.

The plant of the Worthington Pump & Machinery Co., Hazleton, Pa., used last during the war period for munition manufacture, is being dismantled. The machinery will be disposed of at public sale.

The Department of Public Grounds and Buildings, Capitol Building, Harrisburg, Pa., is completing plans and will soon take bids for a new two-story automobile service and repair building, 100 x 200 ft., on North Cameron Street, for State automobiles. It is estimated to cost about $150,000. Samuel B. Rambo is deputy superintendent of the department.

The Ephrata Metal Products Corporation, Ephrata, Pa., has been incorporated with a capital of $20,000 to manufacture metal specialties. J. B. Weidman, Ephrata, is treasurer.

The Delaware, Lackawanna & Western Railroad, Coal Mining Department, Scranton, Pa., will build a new one-story coal washery, 45 x 58 ft., at its property near Wilkes-Barre.

The Allbestos Corporation, Philadelphia, recently organized with a capital stock of $250,000, has plans for the establishment of works at Belfield Avenue and Fisher's Lane for the manufacture of automobile brake linings and similar products. The name of the company was incorrectly given in THE IRON AGE of June 16 as the Asbestos Corporation.

Pittsburgh

PITTSBURGH, June 27.

Some small inquiries have been in the market for equipment for replacement or to be used in making extensions to existing plants, but when followed up it is often found the prospective customer has decided not to buy for the present, largely on account of uncertainty as to the future. Local dealers state that never has inquiry been so light as at present, or so little new business in sight. One dealer states he has not sold a new tool for over four months, and has not a live inquiry at present.

The Ellwood City Foundry & Machine Co. will soon be in the market for some pattern and machine shop equipment and the International Nickel Co. will also need considerable equipment for its new plant at Huntington, W. Va. Luria Brothers, Pittsburgh, are in the market for a locomotive crane with equipment, for their scrap iron yard at Reading, Pa.

The Carnegie Steel Co. has just added electric drives to its 33-in. mill at the Homestead Steel Works, Homestead, Pa., the company having built the equipment in its own shop.

The gear drives for the new plant of the International Nickel Co., Huntington, W. Va., have not yet been given out, but are expected to be placed shortly. These include one 1200-hp. for the 30-in. sheet mill, one 300-hp. for the 26-in. cold mill, one 1200-hp. for a 24-in. billet mill, one 1000-hp. for a 20-in. bar and billet mill, one 800-hp. for a 14-in. merchant mill, one 500-hp. for a 10-in. merchant mill, one 500-hp. for a 9-in. rod mill and one 500-hp. for a 9-in. wire mill. This is the only new work of any magnitude that is in this market at present.

The Duquesne Wire Rope Co., Pittsburgh, has acquired property, 64 x 81 ft., at West Lacock and Corey streets, Northside, for the erection of a new building.

The De Vassie, Beedle & Duffey Automotive Grinding Co., Pittsburgh, is being organized by H. M. DeVassie, William B. Duffey and E. T. Beedle, to operate a general machine works for the grinding and repair of automobile motors, parts, etc. Adolph L. Zeman, 596 Union Arcade Building, represents the company. Application for a State charter will be made on July 22.

The Johnstown Steel Car & Supply Co., Johnstown, Pa., has been incorporated with a capital of $600,000 by H. H. Thompson, I. Schermin and H. Earl Sorber, Johnstown, to manufacture mine car wheels and kindred mine equipment.

The Hawkins Traction Flange Co., Pittsburgh, is being organized by Albert C. and Anthony J. Pauley, and Michael J. Koch, to manufacture flanges for traction cars and other steel products. Application for a State charter will be made on July 12. Ralph H. Frank, 503 Farmers Bank Building, represents the company.

Struble & Riley, Turtle Creek, Pa., have taken bids and will soon award contract for a new two-story automobile service and repair works, 75 x 165 ft., on Grant Street, estimated to cost about $100,000. S. C. Richards & Co., Braddock, Pa., are architects.

The Pratt & Cady Co., Hartford, Conn., manufacturer of valves, steam fittings, etc., has leased the first floor and basement of the building at Ross and Third streets, for a new local establishment.

Henry Althof's Sons Co., 121-23 East Twenty-third Street, Erie, Pa., has been incorporated with a capital of

$75,000 to take over the company of the same name. Operations will be devoted to the manufacture of ornamental and other iron and steel work. G. T. Althof is treasurer.

The Keystone Rubber Mfg. Co., 141-3 East Eleventh Street, Erie, Pa., has completed plans and will take bids at once for rebuilding its plant, recently destroyed by fire with loss estimated in excess of $75,000. It will be three-stories, 123 x 165 ft. J. M. Blake, Commercial Building, is engineer.

George R. West, Jeannette, Pa., formerly president of the Westmoreland Specialty Co., Grapeville, Pa., has organized a new company to be known as George R. West & Sons, to operate a plant at Jeannette for the manufacture of fine wrought iron and decorative glass products. A local building has been secured and machinery will be installed at once. Charles H. and George L. West are interested in the new company.

The Melick Petroleum & Coal Co., Huntington, W. Va., recently organized with a capital of $5,000,000, is planning the erection of a new refinery, estimated to cost close to $1,000,000 with machinery. David L. Melick is president and general manager.

The R. R. Kitchen Co., Wheeling, W. Va., is planning the erection of a new four-story automobile service and repair building, 102 x 130 ft., estimated to cost about $130,000.

Colonel C. C. Pierce, Kingwood, W. Va., is organizing a company to build a new electric power plant in this vicinity for commercial service between Rowlesburg and Cumberland, Md. The plant and transmission system are estimated to cost in excess of $1,500,000.

The Micajah Pocahontas Coal Co., Princeton, W. Va., recently organized with a capital of $300,000, has plans under way for the establishment of a new plant on properties at Micajah, W. Va., to include a power plant, with rotary converter; coal cleaning and screening equipment; mine locomotive and cars, etc. L. R. Taylor is president.

Cleveland

CLEVELAND, June 24.

The local machinery market shows virtually no change. Dealers are getting a few scattered orders, mostly for used machinery in small sizes, although orders placed during the week include two large machines, a 6 ft. radial drill and a 42 in. power squaring shear. No business is coming from the railroads although the Big Four is expecting to place an order shortly for one or two drilling machines. A local builder of drill machinery reports some improvement in inquiries from the East, but these have not yet resulted in orders.

The Kelly Island Lime & Transport Co., has taken bids for an electric traveling crane with 40-ton bridge and a 10 ton trolley, and the Greenville Steel Car Co., Greenville, Pa., is inquiring for a 10-ton electric traveling crane.

The Government has decided to postpone indefinitely the purchase of a 400-ton gantry crane for the Army, for which bids were taken recently.

Conditions in local foundries continue very quiet. Steel foundries are operating at from 15 to 18 per cent of capacity and it is probable that the average operation of gray iron foundries does not show a larger percentage.

The Youngstown Stamping Co., Youngstown, Ohio, has been organized with a capital stock of $50,000 by D. F. Zollner and others and has purchased the plant of the Ungar Steel Products Co., manufacturer of stove pipe.

Charles Palmer, former general manager of the Diamond Match Co., Barberton, Ohio, and others are organizing a company to build a large match factory at Coventry, Ohio.

The Alco Foundry & Machine Co., Wellston, Ohio, has purchased the plant of the Hamden Foundry Co., and is making changes with a view of producing gray iron castings.

A controlling interest in the Lima Iron & Brass Foundry Co., Lima, Ohio, has been purchased by John Reed of Lima.

Cincinnati

CINCINNATI, June 27.

Several local dealers report that the month of June will be the best so far this year, but some good orders have been responsible for this condition. The market generally is quiet, though there are quite a few inquiries being figured on. With few exceptions these are for one and two machines. Manufacturers expect to close for a fair percentage of the business offering, and the hope is expressed that they may be able to continue operating through the summer at present schedules. While no large amount of business is expected the remainder of the year, a steady improvement is looked for in the fall. At present a number of railroad lists are being figured on, and buying is expected to be done shortly after the first of the month. The Kant-Score Piston Co., which is removing its plant from Buffalo to Cincinnati, will buy some tools to round out its equipment. Several other inquiries for a number of machines for domestic users are out and there are also some lists current for export to Latin-American countries. One of the largest sales reported during the week was two boring mills to a mine car manufacturer in West Virginia. Used equipment is also moving fairly well.

The W. J. Savage Co., Inc., Knoxville, Tenn., is in the market for a 5-ton, 70 to 80-ft. span, overhead electric traveling crane, with a.c. motor. It is also considering the purchase of a reversible hoist with or without boiler. Used equipment will be considered. S. T. Weaver is president.

The John Hill Foundry Supply Co. and the Hill & Griffith Co., Cincinnati, will be consolidated July 1 under the name of the Hill & Griffith Co. John Hill, one of the founders of the Hill & Griffith Co., and now president of the John Hill Foundry Supply Co., will be president and general manager of the consolidated companies. William Oberhelman will be vice-president and manager of the Southern district with headquarters at Cincinnati. Bruce Hill will be general sales manager with headquarters at Cincinnati. The new company will have two plants in Cincinnati, but for the present only one will be operated. A complete line of foundry supplies will be carried in stock.

The V. & P. Vacuum Co., Cincinnati, has been incorporated with a capitalization of $25,000 to manufacture a vacuum system for automobiles. It will establish a plant in Cincinnati, but a site has not as yet been selected. Frank J. Zumstein, president Zumstein Taxicab Co., is president of the new company, and W. P. Anderson, president of the Ferro-Concrete Construction Co., secretary and treasurer.

The Dayton Wright Aeroplane Co., Dayton, Ohio, has recently received an order from the Navy Department at Washington for flying machines, aggregating about $500,000. It is reported that part of the company's plant will shortly be devoted to the manufacture of a special type of custom-built automobile bodies. No new equipment will be required at present.

Baltimore

BALTIMORE, June 27.

The Rasin-Monumental Co., National Marine Bank Building, Baltimore, has preliminary plans under way for a new fertilizer manufacturing plant on Fairfield Street, estimated to cost close to $1,000,000 with machinery. The company is now operating a plant in the Curtis Bay district.

The Victor Piston Ring Co., American Building, Baltimore, has been incorporated with $500,000 capital stock to manufacture piston rings, automobile accessories, etc. The incorporators are George D. F. Robinson, F. Pryce and Endora A. Leiby.

The Ogden Brothers Motor Co., 1219 West Lexington Street, Baltimore, has plans under way for the erection of a new service and repair building on Edmondson Avenue, near Bentalou Street, to cost about $50,000.

Extracting, evaporating, refining and other machinery for pulp and paper production will be installed in the new plant to be erected by the International Chemical Products Co., 13 West Saratoga Street, Baltimore. The initial works will consist of six buildings, estimated to cost about $100,000 with equipment. W. A. Gardner is president.

The Board of Directors, Delaware State Hospital, Farnhurst, Del., is having plans prepared for a one-story power house at the institution.

The Gwynns Falls Paper Co., 517 Calvert Building, Baltimore, has taken title to about five acres of property at Gwynns Falls, Baltimore, as a site for its new paper mill, estimated to cost about $250,000. George W. Davis heads the company. Joseph H. Wallace & Co., 5 Beekman Street, New York, are engineers.

The Bureau of Yards and Docks, Navy Department, Washington, has completed plans for a new machine shop at the naval operating base at Hampton Roads, Norfolk, Va.

The Automotive Sheet Iron Works, Florence, S. C., has leased a local building to be erected by F. U. Lake, and will establish a new sheet-metal working and repair plant.

The United States Shipping Board, Washington, has placed the plant of the Government at Richmond, Va., on the market, comprising boiler works, machine shop, steel fabricating plant, foundry, car wheel works, etc. The main building is 160 x 600 ft. Bids will be received until July 27.

The Americus Lighting Co., Americus, Ga., has plans under way for a new electric power plant, 44 x 117 ft., estimated to cost over $200,000, including turbo-generators and auxiliary operating machinery. R. P. Ewing is superintendent.

The Norfolk & Western Railway, Roanoke, Va., J. E.

Crawford, chief engineer, is planning the erection of a new ice plant in the vicinity of Radford, Va., with production to be used over the entire system. It will have an initial production of about 30 cars per day and will be designed and installed by the Engineering Department.

The Juliette Milling Co., Juliette, Ga., is planning for the construction of a new hydroelectric generating plant on the Ocmulgee River, estimated to cost in excess of $150,000. Contract for dam for impounding waters has been let to the Hardaway Construction Co., Atlanta, Ga.

The R. A. Cauthorne Paper Co., Tenth and Cary streets, Richmond, Va., has tentative plans under way for a new paper manufacturing plant at Hull and Brander streets, estimated to cost about $75,000. R. A. Cauthorne is president.

Jackson Nalle, Spencer, N. C., and associates, are planning for the erection of a new factory for the manufacture of cement bricks and kindred products.

Detroit

DETROIT, June 27.

The Utility Compressor Co., 355 Harper Street, Detroit, manufacturer of air compressors, has awarded contract to DeLisle & Cooper, Detroit, for its new one-story plant at Adrian, Mich., estimated to cost about $40,000.

George F. Snyder, Inc., Alpena, Mich., has been incorporated with a capital of $50,000 by George F. Snyder and Samuel Taig, Alpena, to manufacture aluminum, brass, bronze and other metal castings.

The Detroit Alloy Steel Co., Detroit, has been incorporated with a capital of $50,000 by Frank L. Griffin, Robert H. Hall and John Grant, 1938 Taylor Avenue, to manufacture alloy steel products and other metal specialties.

The General Motors Corporation, Detroit, has merged its two subsidiaries, the Delco Light Co. and the Frigidaire Corporation, with R. H. Grant, general manager of the first noted, acting in the same capacity for the consolidated interests. It has not as yet been announced if the plant of the Frigidaire company at Detroit will be removed to the Delco works at Dayton, Ohio.

The Ford Motor Co., Detroit, has preliminary plans under way for a new two-story plant at Pinckney, Mich., for the manufacture of certain specialties used for Ford automobiles. It is estimated to cost about $45,000.

The Ludington Novelty Co., Ludington, Mich., has been incorporated with a capital of $50,000 by L. E. Vorse, William C. Killean and Bernard Ostendorf, all of Ludington, to manufacture steel needles, metal toys and novelties.

A one-story power house will be erected by the Harper Hospital Association, Detroit, in connection with the new addition at the institution, estimated to cost about $85,000. Albert Kahn, 1000 Marquette Building, is architect.

The machine shop and several other buildings of the Delta Chemical Co. at Wells, Mich., were destroyed by fire last March and were again destroyed by fire last week while in course of reconstruction. They will be rebuilt.

The Gulf States

BIRMINGHAM, June 27.

The Knowlan Machine & Supply Co., Victoria, Tex., has plans under way for a new one-story machine shop for general construction and repair work. Frank Knowlan is head.

The Bureau of Yards and Docks, Navy Department, Washington, has awarded a contract to J. N. McCannon, Fort Bliss, Tex., for a one-story addition to the machine shop at Fort Crockett, Tex.

The Flippen Auto Co., 2021 Cedar Springs Street, Dallas, Tex., has completed plans for a new two-story service and repair works, 100 x 200 ft., on Ross Avenue, to cost about $125,000. Barcelbaugh & Whitman, South West Life Building, are architects.

The Edmunds Oil & Refining Co., Bridgeport, Tex., is planning for a number of extensions and improvements in the refinery of the Bridgeport Refining Co., recently acquired. The capacity will be increased.

The Osborne Brothers Co., West Palm Beach, Fla., has completed plans for the construction of a new cold storage plant, to have an initial capacity of about five carloads a day. It is estimated to cost about $30,000.

The American Granite Corporation, Houston, Tex., recently organized with a capital of $350,000, has plans under way for the development of extensive granite properties near Llano, Tex., and will equip a plant for this purpose. Henry S. Fox, Jr., is president and John H. Kirby, vice-president.

A refrigerating and ice-manufacturing plant will be erected by the American Legion Memorial, Austin, Tex., at its proposed new sanitarium at Kerrville, Tex., estimated to cost, complete, about $1,200,000. A power plant will also be constructed. Phelps & Dawes, 715 Gunter Building, San Antonio, Tex., are architects.

The Birmingham Canning Machinery Co., Seventh and Thirteenth streets, Birmingham, recently organized, will operate a local plant for the manufacture of canning machinery and parts. A. Dewey Smith is head.

The Buffalo Producing & Refining Co., Sherman, Tex., is planning for additions in its refinery to increase the capacity from 300 to 1000 bbl. per day. The company recently acquired the Texas Interstate Producing & Refining Co. T. E. Wood is secretary and treasurer.

The Winter Park Refrigerating Co., Winter Park, Fla., is said to be planning to rebuild its ice and refrigerating plant, recently destroyed by fire with loss estimated at about $30,000.

R. R. Kelly, Houston, Tex., and associates, are organizing a company to construct and operate an oil storage and oiling plant on the ship canal, to cost about $250,000. The storage plant will have an initial capacity of about 75,000 bbl. Pumping machinery, bunkering equipment and other apparatus will be installed.

The Osborne Brothers Co., West Palm Beach, Fla., is erecting a cold storage plant to cost about $30,000.

California

LOS ANGELES, June 21.

The Clark-Turner Piston Co., 1246 South Los Angeles Street, Los Angeles, has filed plans for a one-story addition to its machine shop at 693 South Utah Street.

The Reliance Auto Repair Shop, 2050 Haste Street, Berkeley, Cal., is planning to rebuild its machine works, destroyed by fire, June 12, with loss estimated at about $17,000.

The Bureau of Yards and Docks, Navy Department, Washington, has taken bids for the erection of a new machine and mechanical shop at the Navy yard at San Diego, Cal.

The Los Angeles Gas & Electric Corporation, Los Angeles, has arranged for a bond issue of $3,500,000, the proceeds to be used for additions and improvements in its electric power plant and system. William Baurhyte is vice-president and general manager.

The Standard Sheet Metal Works, 310 East Ninth Street, Los Angeles, has filed notice of organization to manufacture metal specialties. Fred W. Roberts, 1477 West Forty-fifth Street, heads the company.

The General Petroleum Co., 310 Sansome Street, San Francisco, has disposed of a note issue of $10,000,000 the proceeds to be used for general operations, extensions and financing.

Fire, June 14, destroyed one of the mechanical buildings at the plant of the Moore Shipbuilding Co., Oakland, Cal., with loss reported at about $14,000.

The Utah Oil Refining Co., Salt Lake City, Utah, is planning for the rebuilding of the portion of its plant destroyed by fire, June 12, with loss estimated at about $1,0000,00, including equipment.

The Central South

ST. LOUIS, June 27.

The Chester Iron & Foundry Co., 7800 Vulcan Street, St. Louis, is taking bids for a new one-story plant, 45 x 115 ft., estimated to cost about $40,000. A. J. Schaelich is president.

The City Council, Sayre, Okla., will soon take bids for the installation of additional equipment at the municipal electric power plant, estimated to cost about $35,000. V. V. Long & Co., 1300 Colcord Building, Oklahoma City, Okla., are engineers. W. Benjamin Turner is chairman of the lighting committee.

The Franklin Carriage Works, Jackson, Tenn., is taking bids for a new one-story addition, 60 x 150 ft. R. A. Heavner, Elks Building, is architect.

The Combined Grate & Radiator Heating Co., Knoxville, Tenn., recently incorporated with a capital of $30,000, will operate a plant at Fountain City, Tenn., for the manufacture of radiators, grates and other heating equipment. The company has organized with H. E. Kelly, P. O. Box 17, Fountain City, as president; and W. E. De Armond, general manager.

The Virginia Bridge & Iron Co., Roanoke, Va., with branch plant at North Memphis, Tenn., has acquired about 10 acres on the Wolfe River, formerly occupied by the Anchor Saw Mills, for the establishment of a new plant in the Memphis district for the production of all-steel barges. Preliminary work has been commenced; existing buildings will be remodeled and improved to accommodate the new industry and

machinery installed at once. The steel to be used in construction of the barges will be fabricated at the North Memphis plant. Orders have been taken for the construction of four barges for oil service in the vicinity of New Orleans, to be 30 ft. wide and 125 ft. long.

About $200,000 will be expended by the Knoxville Fertilizer Co., Knoxville, Tenn., for the erection and equipment of its new plant. The machinery installation will include crushers, grinding equipment, elevating and conveying machinery, etc. James W. Dean is secretary and treasurer.

The Peavine Coal Co., 20 Stohlman Building, Nashville, Tenn., recently formed with a capital of $600,000, is planning for the installation of electrically operated mining machinery at its properties near Peavine, Tenn. Prices on equipment are being asked. J. H. Ragsdale is president; and Granberry Jackson, secretary and engineer.

The Covington-Buick Co., Covington, Ky., is having plans prepared for the erection of a two-story and basement service and repair building, 60 x 200 ft., at Sixth and Scott streets. Alfred Dailey, City Hall Building, is architect.

The Chamber of Commerce, Hugo, Okla., has engaged engineers to make surveys for the new municipal electric power plants to be erected under its auspices in this section. The project is estimated to cost in excess of $4,000,000.

Prof. G. D. Newton of the School of Engineering, University of Missouri, Columbia, has begun work on plans for a new power house for the university.

The Crunden-Martin Mfg. Co., St. Louis, has completed a $400,000 addition, six floors and basement, with 90,000 sq. ft. of floor space. It will be used for the manufacture of galvanized iron products.

Indiana

INDIANAPOLIS, June 27.

The Terre Haute Boiler Works, Terre Haute, Ind., is planning for the construction of a new one-story plant on North Thirteenth Street, estimated to cost about $75,000.

Coats Steamers, Inc., Terre Haute, Ind., has been incorporated with a capital of $5,000,000 by Earl R. Cox, W. S. McCloud, Terre Haute; and Louis Clements, Danville, Ill., to manufacture steam driven automobiles.

The Electric Safety Equipment Co., Angola, Ind., has been incorporated with a capital of $25,000 to manufacture electrical equipment and accessories. The incorporators, all of Angola, are J. B. Fitch, H. G. MacLellan and E. A. Skinner.

Plans for a new power plant and one-story automobile service and repair works are being prepared by St. Elizabeth's Hospital, Fourteenth and Hartford streets, Lafayette, Ind. D. X. Murphy, Louisville Trust Building, Louisville, Ky., is architect.

The Edwards Valve & Mfg. Co., 1200 145th Street, East Chicago, Ind., is perfecting plans for a new building, to replace its works, destroyed by fire several months ago. The new structure is estimated to cost in excess of $400,000. W. T. Branitsky, 64 West Randolph Street, Chicago, is architect.

Milwaukee

MILWAUKEE, June 27.

The resumption of production by passenger car factories in this and other centers this week and next is expected to be a stimulant to the machine tool business. The recession of operations in automobile factories the last four to six weeks has been seriously felt. Railroad buying also is expected to pick up to some extent after July 1. There has been some inquiry from this source in the past week or two which appears likely to develop some business.

The American Metal Products Co., 671 Kinnickinnic Avenue, Milwaukee, which is building a new brass foundry at Thirty-seventh Avenue and Burnham Street, has let the contract for furnishing and installing a ½-ton electric melting furnace to the Detroit Electric Furnace Co., Detroit. The shop is 60 x 120 ft., of brick and steel. It manufactures brass and bronze castings, bearing metal, etc., under patented formulae, and the product is known as Ampco bronze. Carl J. Zaiser is secretary-treasurer and general manager.

The Apex Auto Accessory Co., Eau Claire, Wis., has been organized with a capital stock of $10,000 to manufacture metal specialties, principally for the automotive industries. The incorporators are Ralph R. Jones, William H. Griffin and C. M. Olson, all of Eau Claire.

The Meehan Mfg. Co., Milwaukee, organized about six months ago with a capital stock of $250,000 to manufacture self-contained electro-generating plants, farm lighting systems, etc., has selected Jackson, Wis., as the site of its permanent works. It has changed its corporate style to Jackson Light Mfg. Co.

The Farmers Tractor Corporation, originally organized at Oshkosh, Wis., but now permanently located in Stevens Point, Wis., contemplates the erection of a machine shop and assembling floor as the initial units of the new works. Later a foundry will be added. Construction will begin about Aug. 1. Plans and specifications for buildings and equipment are being prepared by Page, Beck & White, Inc., Chicago, mechanical, automotive and industrial engineers. A. J. Patch is vice-president and general manager.

The Board of Education, Janesville, Wis., is taking bids until July 11 at 3.30 p. m. for a new high school and vocational training institute estimated to cost $300,000. The architects are Van Ryn & DeGelleke, Caswell Block, Milwaukee.

The Barron County Board of Supervisors, Barron, Wis., has authorized Edward Gleason, county highway commissioner, to contract for the construction of a brick and concrete machine and blacksmith shop, 60 x 100 ft., and 30 x 40 ft., respectively, for the care, maintenance and repair of highway equipment, motor trucks, etc. It will cost about $20,000 complete.

The Lighting Products Corporation, Wauwatosa, Wis., has been incorporated with a capital stock of $40,000 preferred and 100 shares of common stock without par value, to manufacture electric lighting fixtures, line materials, etc. The incorporators are Clarence Ullman, W. F. Zack and J. J. Meyer, all of Wauwatosa.

Canada

TORONTO, June 27.

Little change is reported in the machine tool market during the week. Inquiries for equipment are more numerous, but the majority of these are merely feelers, and dealers do not expect to derive much business on their account. In some respects business is fairly active, but generally speaking the market is dull. From quite a number of districts in the Dominion dealers are closing orders for one or two tools, which is helping to strengthen market conditions, but present buying is confined to small quantities and no big orders are being placed. Used equipment continues to head the list of machinery and tools disposed of by dealers. Small tools continue fairly active, but the demand for these is by no means brisk.

The Provincial Paper Mills Co., 56 University Avenue, Toronto, proposes to construct a boiler house at Mille Roches, Que.

Walter McLean, Wallaceburg, Ont., contemplates the erection of a planing mill and is interested in prices of equipment.

The sawmill at Mount Joli, Que., owned by Compagnie de Transfer de Mount Joli, and other buildings were destroyed by fire with a loss of $150,000.

The iron foundry owned by Fleming Brothers, Cabot Street, Halifax, N. S., which was recently destroyed by fire with a loss of $15,000 will be rebuilt. Prices on equipment are being asked.

According to C. L. Thompson of the Martin Engineering Co., Niagara Falls, Ont., plans have been prepared and construction will start at an early date on a brick and glazed tile plant at Winnepeg, Man., which will have an annual capacity of 20,000,000 bricks.

Plans of New Companies

The Bresswell Co., 641 Land Title Building, Philadelphia, recently organized, is a selling company, selling Flexo lenses and an improved manhole gasket. It does no manufacturing.

The Refrigerating Machinery Co., New Haven, Conn., recently incorporated, is the New England representative of the Frick Co. of Waynesboro, Pa. It designs and installs complete ice making and refrigerating plants, as it had been doing for the preceding two years as a partnership.

The R. W. Wilson Machine Co., 1195 Dorchester Avenue, Boston, general machinist, intends to have some work done by contract. All of its equipment has been installed. It is also looking for contract work.

The Levelgraf Co. of America, Trenton, N. J., recently incorporated with a capital of $1,000,000, is contracting for all of the parts of its apparatus, which it will assemble. Eventually, however, it will have a complete plant of its own at Trenton. This will probably be next year. The company's device is designed to give correct readings of the contents of tanks at a distance. It is now in use on motor cars throughout Europe. It is adaptable for automobiles, motor boats, airplanes and gas stations.

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Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per Lb.
Bars:	
Refined bars, base price	3.13c.
Swedish bars, base price	12.00c.
Soft steel bars, base price	3.23c.
Hoops, base price	4.15c. to 4.18c.
Bands, base price	3.78c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	3.23c.
Channels, angles and tees under 3 in. x ¼ in., base	3.23c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.13c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	3.33c.
Toe calk, ½ x ⅝ in. and larger	3.75c.
Cold-rolled strip, soft and quarter hard	10.00c. to 10.50c.
Open-hearth spring steel	4.50c. to 8.00c.
Shafting and Screw Stock:	
Rounds	4.38c. to 4.63c.
Squares, flats and hex	4.98c. to 5.13c.
Standard cast steel, base price	14.00c.
Extra cast steel	17.00c.
Special cast steel	22.00c.

Tank Plates—Steel

¼ in. and heavier	3.23c.

Sheets

Blue Annealed

	Per Lb.
No. 10	3.88c.
No. 12	3.93c.
No. 14	3.98c.
No. 16	4.09c.

Box Annealed—Black

	Soft Steel C.R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.55c. to 4.95c.	.....
Nos. 22 and 24	4.60c. to 5.00c.	5.60c.
No. 26	4.65c. to 5.05c.	5.65c.
No. 28	4.75c. to 5.15c.	5.75c.
No. 30	5.00c. to 5.40c.	.....

No. 28, 36 in. wide 10c. higher.

Galvanized

	Per Lb.
No. 14	4.50c. to 4.75c.
No. 16	4.75c. to 5.00c.
Nos. 18 and 20	4.90c. to 5.15c.
Nos. 22 and 24	5.05c. to 5.30c.
No. 26	5.20c. to 5.45c.
No. 27	5.35c. to 5.60c.
No. 28	5.50c. to 5.75c.
No. 30	6.00c. to 6.25c.

No. 28, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Blk.	Galv.	*Wrought Iron*	Blk.	Galv.
½ in. Butt...	—46	—30	¾ in Butt....	—18	List
¾ in. Butt...	—52	—37	1-1½ in. Butt.	—20	— 2
1-3 in. Butt..	—54	—40	2 in. Lap	—14	+ 3
3½-6 in. Lap.	—49	—35	2½-6 in Lap..	—18	— 2
7-12 in. Lap..	—40	—24	7-12 in. Lap..	— 7	+10

Steel Wire

BASED PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	4.50c.
Annealed soft	4.50c.
Galvanized annealed	5.25c.
Coppered basic	5.00c.
Tinned soft Bessemer	6.50c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	16 c. to 19¼c.
High brass wire	17¼c. to 21¾c.
Brass rod	15 c. to 20¾c.
Brass tube, brazed	29½c. to 31½c.
Brass tube, seamless	19½c. to 20½c.
Copper tube, seamless	22½c. to 23¼c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 22c. to 24c. per lb. base.

Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14x20		
			Primes	Wasters
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb....	$7.30	$7.05
		90 lb....	7.40	7.15
		100 lb....	7.50	7.25
IC..	$11.10	$10.00	IC...	7.70	7.45
IX..	12.30	11.25	IX...	8.60	8.35
IXX..	14.10	12.75	IXX...	9.60	9.35
IXXX..	16.10	14.75	IXXX...	11.00	10.75
IXXXX..	17.70	16.50	IXXXX...	12.00	11.75

Terne Plates

8-lb. Coating 14 x 20

100 lb.	$8.00
IC	8.25
IX	8.50
Fire door stock	11.50

Tin

Straits pig	32½c.
Bar	38c. to 40c.

Copper

Lake ingot	16c.
Electrolytic	16c.
Casting	16c.

Spelter and Sheet Zinc

Western spelter	6½c. to 6¾c.
Sheet zinc, No. 9 base, casks	11½c. open 12c.

Lead and Solder*

American pig lead	5½c.
Bar lead	6¼c. to 6¾c.
Solder, ½ and ½ guaranteed	24¼c.
No. 1 solder	21½c.
Refined solder	18½c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	80c.
Commercial grade, per lb.	40c.
Grade D, per lb.	35c.

Antimony

Asiatic	6½c. to 7c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.... 30c. to 33c.

Old Metals

Business has practically closed. The few transactions taking place being at bargain prices. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	10.00
Copper, heavy and wire	9.25
Copper, light and bottoms	8.00
Brass, heavy	5.00
Brass, light	4.00
Heavy machine composition	8.75
No. 1 yellow brass turnings	4.50
No. 1 red brass or composition turnings	6.75
Lead, heavy	3.50
Lead, tea	2.50
Zinc	2.75

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